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Data on the environmental requirements for 245 taxa of North American Trichoptera are compiled from 294 references. This compilation is prepared to assist biologists in evaluating data from macroinvertebrate samples collected for the assessment of water quality. The following parameters are considered: life stage, general habitat, specific habitat, retreat, diet, turbidity, current, temperature, pH, D.O., alkalinity (phenolphthalein and total), nitrates, nitrites, ammonia, phosphorus (ortho and total), seasonal distribution, and geographic distribution. Where possible ranges for the parameters mentioned are given. Additional parameters such as toxic compounds, heavy metals, and pesticides are included when available.

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ENVIRONMENTAL REQUIREMENTS AND POLLUTION TOLERANCE OF TRICHOPTERA

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FOREWORD

Environmental measurements are required to determine the quality of ambient water, the character of effluents, and the effects of pollutants on aquatic life. The Environmental Monitoring and Support Laboratory - Cincinnati conducts research to develop, evaluate, and promulgate methods to:

- * Measure the presence and concentration of physical, chemical, and radiological pollutants in water, wastewater, bottom sediments, and solid waste.
- * Concentrate, recover, and identify enteric viruses, bacteria, other microorganisms in water.
- * Measure the effects of pollution on freshwater, estuarine, and marine organisms, including the phytoplankton, zooplankton, periphyton, macrophyton, macroinvertebrates, and fish.
- * Automate the measurement of physical, chemical, and biological quality of water.
- * Conduct an Agency-wide quality assurance program to assure standardization and quality control of systems for monitoring water and wastewater.

The effectiveness of measures taken to protect the biological integrity of the Nation's surface waters is dependent upon our knowledge of the environmental requirements of aquatic organisms and our understanding of the complex relationships that prevail in aquatic ecosystems. This study focuses on one of the most abundant groups of aquatic insects--the Trichoptera (caddisflies). The larvae show great ecologic and taxonomic diversity, are involved in the food chains of most types of freshwater habitats, and the many species demonstrate different tolerances to pollution. The larvae and adults are also important in the diets of fish and birds.

This report is the fifth in a series of reports in preparation on the environmental requirements and pollution tolerance of aquatic organisms. Water quality profiles have been developed to serve as companions to the EPA biological methods manual and identification manuals to assist biologists in evaluating data collected during studies concerning the effects of toxic substances and other pollutants on the structure of indigenous communities of aquatic organisms.

Dwight G. Ballinger
Director
Environmental Monitoring and
Support Laboratory - Cincinnati

ABSTRACT

Data on the environmental requirements for 245 taxa of North American Trichoptera are compiled from 294 references. This compilation is prepared to assist biologists in evaluating data from macro-invertebrate samples collected for the assessment of water quality. The following parameters are considered: life stage, general habitat, specific habitat, retreat, diet, turbidity, current, temperature, pH, D.O., alkalinity (phenolphthalein and total), nitrates, nitrites, ammonia, phosphorus (ortho and total), seasonal distribution, and geographic distribution. Where possible ranges for the parameters mentioned are given. Additional parameters such as toxic compounds, heavy metals, and pesticides are included when available.

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The authors would like to acknowledge the overwhelming response of the membership of North American Benthological Society who were solicited for "hard to find" information on Trichoptera. A special thanks goes out to the relatively few taxonomists who have contributed indirectly by confirming hard to identify larvae for many organizations, firms, and individuals. These identifications have made the water quality profiles possible. Sincere thanks also go to Drs. Glenn Wiggins and Guenter Schuester for making data available prior to publication.

Those contributing directly to the compilation, typing, indexing and bibliography include Ms. Janene Kummer, Ms. Liza Lemke and the secretaries of the Department of Entomology, Purdue University. Their help was most gratefully accepted. The profiles themselves are made possible through the support and cooperation of The Aquatic Biology Section, Biological Methods Branch, Environmental Monitoring and Support Laboratory, and Purdue University Agriculture Experiment Station to whom we are most grateful.

SECTION I

INTRODUCTION

The term profile indicates a graphic or numerical representation of the striking characteristics of something. This compilation of Water Quality Profiles of Trichoptera is just that. It is a graphic presentation of what we found to be some of the major biologic and ecologic characteristics of a limited number of species in the order Trichoptera. There should be no doubt in the reader's mind that this is merely an outline of what is known of some of the "representative" or "major" species (if there are such species!) in the order. As the larvae are known for only approximately 25% of the species in the order, by no means can these profiles be complete. Utilizing these profiles as you would any other graphical outline and when possible fill them in as more and better data become available.

The principal objective of this project is to compile and publish in a single source the background information needed to use common species of the order Trichoptera as a "delicate tool" in assessment of pollution. The value of biological indicator organisms in the detection and measurement of water pollution has been long known (Forbes 1928). Their use as indices of water quality has been well documented (Van Horn 1949, Bartsh and Ingram 1959, Hynes 1970, and others). Indeed, it is demonstrated that "insects can be a useful and rapid tool in the investigation of pollution and also a very delicate one, but like all such instruments must be used with skill and dexterity" (Hynes 1962). The skill and dexterity to which Hynes alludes in regard to using insects as indicators of environmental quality is directly dependent upon basic biological and ecological information regarding the species being used. A peak read off the chart of a gas chromatograph is useless when nothing is known of the retention time, temperature, or amount of compound sampled, the basic background information needed for its analysis. So also data on the abundance and species composition of fresh water benthic invertebrates unless the water quality requirements and life cycles of the organisms are known. The caddisflies are an important and abundant component of the benthic macroinvertebrate community. But data on the occurrence of these organisms is difficult to evaluate. Bits and pieces of information concerning the water quality requirements and life cycles of Trichoptera are scattered throughout the literature. In order for such information "bits" to be used as a "delicate tool" in the investigation of causes, control, and prevention of water pollution they must be brought together. It is hoped these profiles will bring together some of these data on water quality requirements and life cycles of the Trichoptera in order that the species of this order may be better used to chronicle water quality conditions, both past and present.

A second objective of this project is to provide a bibliography of some of the literature available on the water quality requirements of Trichoptera in order to eliminate costly and time consuming literature searches which currently hold up progress and add to the expense of water pollution control, research, and development projects.

A third objective of this project is to determine the status of Trichoptera in programs relating to the causes, control, and prevention of water pollution. Gaps in the ecological data from these organisms should delineate which species are of general and finite use to the water pollution biologists.

Trichoptera demonstrate greater ecologic as well as taxonomic diversity than all other totally aquatic orders. There are approximately 144 genera and 1,250 species of North American caddisflies. Compilation of information on their ecological parameters is no small task. Very limited data or no data are available on better than 900 species. Indeed, only about 25% of all North American species are known from the larval state. Truly conclusive profiles can be drawn for only about 20 species which are well known both from a taxonomic and ecologic point of view. Greater amounts of information are available on the larger, more common easily reared or easily identifiable species such as *Brachycentrus americanus* (Banks), *Helicopsyche borealis* (Hagen), *Hydropsyche orris* Ross, *Pycnopsyche guttifer* (Walker), *Rhyacophila lobifera* Betten, or *Symphitopsyche bronta* Ross. These species, however, are not typical of many lentic and lotic habitats. No general habitat restrictions can be placed on members of the order. Although some caddisfly species and genera are narrowly specialized and restricted to a single biotype, many species appear to have a wide ecological range and live under variable conditions. It is hoped that the profiles which follow should aid in the definition of the ecological distribution of this large and diverse group.

SECTION II

DATA COMPILATION

The format for data compilation of these profiles follows that suggested by the Aquatic Biology Section, Environmental and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, for use with macroinvertebrates. It utilizes parameters and/or spectral ranges which may singly or in combination restrict caddisfly distribution. These parameters, which are defined below, are accompanied, where possible, by quantification of the range of the particular physical or chemical factors in order to further delineate from where the species is actually known. Where additional water quality data are available they are included in the notes and comments below the actual profile. The ranges given are mostly extracted from environmental reports. When two or more reports gave water quality data for a particular parameter, the values for the range represent the minimum and maximum values encountered or if the same only one is utilized. In some cases, the minimum value is extracted from one report, the maximum from another.

Many reports give yearly or bimonthly summaries of water data and often times record a particular species of caddisfly from only one or two dates when macroinvertebrate samples were taken. In these cases a summary of the water quality is presented and the assumption made that the caddisflies tolerate the water quality throughout the year. There is danger in making this assumption as all of the stages in a species life cycle may not be able to tolerate the extremes of the environment encountered during the whole year as presented by the profile. However, until more data becomes available, such information will provide at least a delineation of the specific habitat at which the species occurred. The seasonality of the various life stages, each with their own tolerance limits, should be taken into consideration when viewing these profiles.

Historically most studies on Trichoptera have emphasized adult taxonomy, and there is a paucity of literature available on larvae of North America. In this general survey the fact that larvae are more difficult to identify to species level than adults is pronounced. In less than one-fourth of the articles solicited on water quality data and caddisfly distribution are the caddisflies taken to species level. This is especially true in the family Hydropsychidae, the most abundant family in the eastern United States.

In some instances, we are able to utilize systematic studies for distributional data and observations on general ecology, life cycles and emergence. Especially valuable are works by Wiggins, The Larvae of North American Trichoptera, and his chapter on Trichoptera in Merritt and Cummins (1978), Aquatic Insects of North America. These references, although only to family and generic level, provide synopsis of distribution, morphology, case, and biology of each North American genus. Also, the bibliographies of these publications present the most recent review of taxonomic references for the species of Trichoptera. The treatment of genera in this publication follows that of Wiggins (1977). By far, most of the data we report on is pulled from surveys, impact statements, thesis, and monitoring reports provided by practicing water quality biologists. These data, published with only a secondary concern for Trichoptera, provide the basis for more than half of our profiles. The reliability of identifications in these reports is assumed to be correct and if possible is confirmed. Often times a wide interpretation of the data is necessary to categorize the information.

Although each species has its own environmental requirements, often times general statements regarding ecological tolerances can be made on the familial or generic level. An introduction to each family precedes the profiles for species of that family. These introductions emphasize the lack of ecological research that is done regarding caddisfly larvae and adults. In recording the data several apparent trends became obvious, and these are recorded in these introductions.

By no means should the reader regard these profiles complete. The profiles present are a compilation of only data that is available to us. Indeed in many cases the sample size is extremely small and the data base from which the profile has been drawn may be atypical for that species. This compilation should be regarded as a starting point toward a definitive assessment of the water quality requirements for the order and hopefully will prove useful to those utilizing Trichoptera in environmental studies.

SECTION III

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SECTION IV

ECOLOGICAL PARAMETERS

The profile sheets include information on the source of information and various ecological parameters of the environment. The species distribution may be affected by many of these parameters either singly or in combination. These profiles do not record biotic or density dependent factors as there simply is not enough information available.

The information is organized as follows.

1. SOURCE: This horizontal column contains a reference number to the citation in the bibliography. An attempt is made to keep the bibliography in alphabetical order. In most cases not all twenty-one columns are filled, and user is encouraged to fill these in with data which is not included as it becomes available. The references cited may not be the only ones at our disposal that had information on that particular species. Often we did not cite papers with minimal or no water quality data, especially if recorded papers with water quality contained the life history or distribution data. In most cases rather than be redundant, only the references with the most water quality data and/or the most unique data are included.

2. STAGE, ADULT OR LARVAE: This refers to the stage or stages to which the data refer. Larval data hold preference over adult data in our selection of references.

3. GENERAL HABITAT: The freshwater habitat to which one would go to find the species is noted here. Lakes/ponds, rivers, streams, springs, and temporary waters are found to be the most frequently utilized habitats and are included. Rivers are defined as larger flowing waters, streams smaller flowing waters. Springs as a habitat include seepages. See notes and ranges for further description for specific species.

4. SPECIFIC HABITAT: Five categories are utilized to describe the specific habitat of caddisflies. All caddis larvae are considered benthic and if they are found above the substrate they are classified as epibenthic. If the reference refers to the species as burrowing into the substrate, they are classified as embenthic. If the organisms are typically found on rocks or plants, they are considered epilithic or epiphytic respectively. Other

substrates which are noted as providing specific habitat are noted under the heading "other."

5. HOME: Most caddisflies can be classified as freeliving, retreat builders or casemakers. Their "home" often times allows them to adapt to their environment and therefore is included in the profile.

6. DIET: Distribution of trichopteran species is dependent on the presence or absence of food for growth and development. General categories of carnivore, herbivore, omnivore and detritivore are included here. Even by using these broad categories there is overlap within species, especially during different stages of development. Carnivore denotes those larvae which feed on other animal matter; herbivore, the plant feeders; omnivore, those species that are recorded as feeding on both plant and animal species; and detritivore, those species that feed on nonliving plant, animal and inorganic matter. There is need for more work on delineation of trophic categories for Trichoptera. The traditional categories which classify larvae as scrapers, shredders, collectors and gougers would fall in herbivores, detritivore or omnivore categories depending on species.

7. TURBIDITY: Rheophillic caddisfly species are often restricted by the turbidity of their habitat. Turbidity is given by Jackson Turbidity Units (JTU's) unless otherwise noted. This is done to eliminate any discussion over what might be considered clear, clouded, or murky water.

8. CURRENT: Many caddisflies are rheophillic and dependent on current. The speed of the current is given by range in either ft/second or meters/second.

9. TEMPERATURE: Trichoptera have both steno- and eurythermal species. Warm water species that often are encountered up to and above temperatures of 30°C were considered euthermal. Mesothermal species were those temperature water forms characteristically reported from water temperatures occurring between 15° and 30°C. Oligothermal species are typical cold water species and are usually found at temperatures between 0-15°C. Stenothermal species are most commonly found at temperatures at 5°C or below. Ranges at which each species of caddisfly is found at are given. Often a species would occur over several temperature categories and the temperature range at which the species was encountered is given.

10. pH: This parameter is subdivided into four categories and ranges are given. If a species is found to be abundant in highly acid waters < 5.5, it is considered acidobionic. If it occurs in waters that are only slightly acid (below a pH of 7) it is considered acidophilic. Species which are found most commonly at

slightly alkaline pH (slightly above a pH of 7) are considered alkaliphilous. Alkalibionic species prefer a pH of above 8.5. As with many of the physical and chemical parameters outlined, several species would fit in more than one category.

11. DISSOLVED OXYGEN: Dissolved oxygen is presented in the profiles as being recorded as per cent saturation and/or milligrams per liter.

12. H_2O CHEMISTRY: The profile sheets acknowledge and give reference to articles that deal with other water quality parameters especially those indicative of non-organic water pollution. Alkalinity, nitrates, nitrites, ammonia and phosphorus are recorded when available. Ranges are given for these parameters. Both phenolphthalein and total alkalinity are considered. Total and ortho phosphorus are recorded.

13. SEASONAL DISTRIBUTION: This column should enable the user to determine when the insect is found during the year. Ranges are given with earliest and latest collection dates during the year for both larvae and adults. Data available from many taxonomic publications is not included here.

14. GEOGRAPHICAL DISTRIBUTION: Distribution of caddisfly species is given by U.S. Environmental Protection Agency regions. A map delineating these regions follows (Fig. 1). Distribution is further delineated by a listing of states and provinces mentioned for each species. In many ways this may seem to be an artificial way of presenting distributional data, especially when a species may be restricted to an isolated river system or occur in a drainage that crosses four different regions. However, mapping distribution by region enables the practicing water pollution biologist to see at a glance if an organism might be found in the region he is sampling. Finer details on geographic distribution can be gained by consulting the references listed in the bibliography. The scope of these profiles is restricted to North America north of Mexico. Some species considered have wider ranges than analyzed here.

15. ADDITIONAL WATER DATA AND COMMENTS: It would be almost impossible to devise a profile sheet that would consider all the water quality parameters that might affect an organism. However, some information is available to us on caddisfly distribution and toxic compounds, heavy metals and pesticides. These data are included when they are available to us. If the data are available from more than one source, the range of the parameter is given. Reference numbers which follow the data given are to the sources listed in the bibliography.

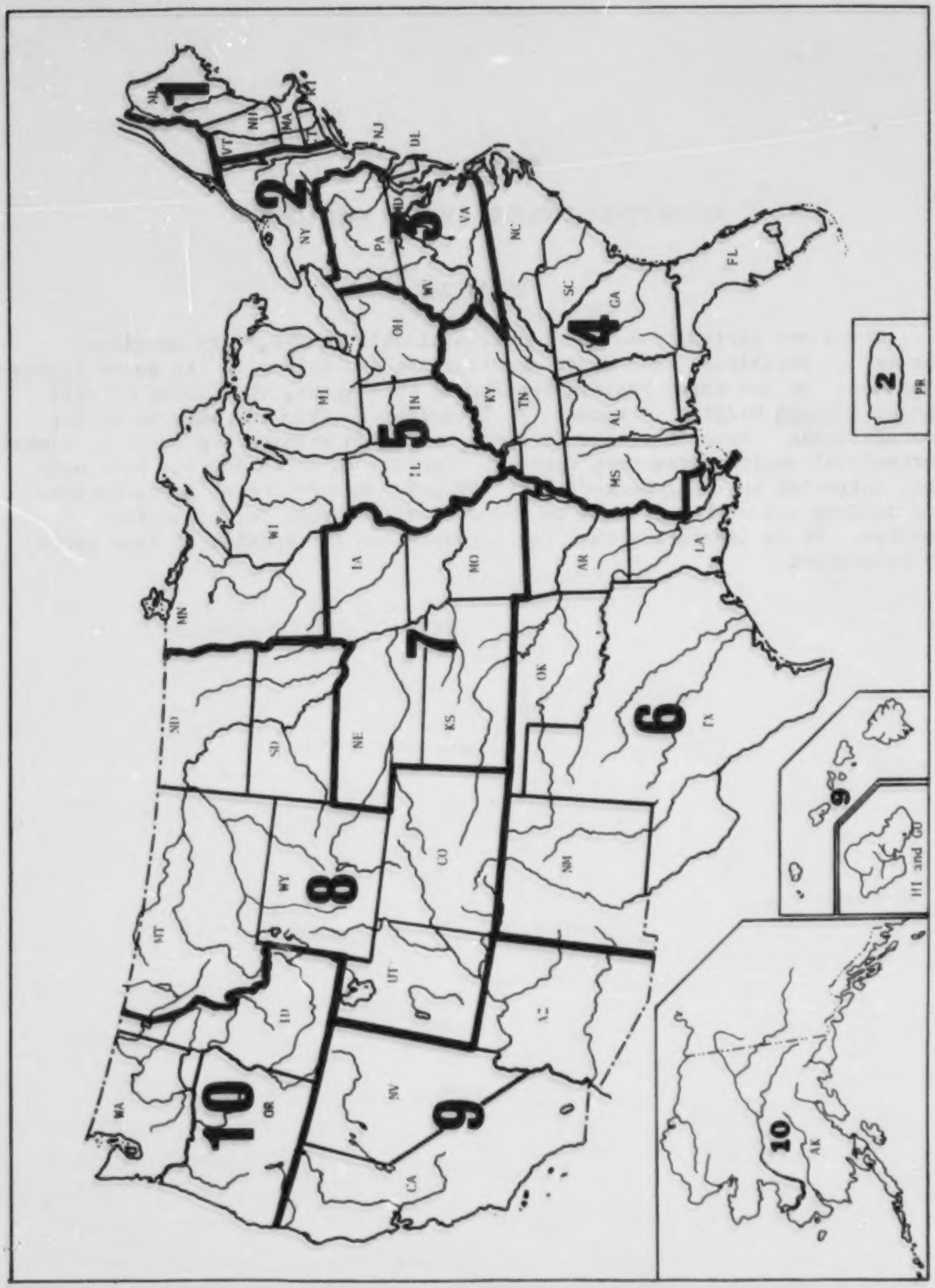
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Figure 1. U.S. Environmental Protection Agency regions.

SECTION V

TRICHOPTERA INCLUDED IN THIS COMPILATION

BERAEIDAE

There are virtually no water data available on the North American species of Beraeidae. All North American species belong to the genus Beraea Stephens. Of the three neartic species of this genus, the larvae of only Beraea fontana Wiggins is known. It is collected from wet muck in spring seepage areas. Several of the European and Asian species are found in almost terrestrial environments near springs. Species in North America have only been collected in local pockets near springs. Environmental perturbations and decling water tables could be the downfall of this North American species. It is imperative that requirements for the species of this genus be determined.

Beraeidae *Beraea sp.*

		178	NOTES OR RANGES
	SOURCE	178	
	PARAMETERS		
	LARVAE	X	
	ADULT		
GENERAL HABITAT	LAKE/POND	X	
	RIVER		
	STREAM		
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON		
	EMBENTHIC IN		
	EPILITHIC ROCK		
	EPIPHYTIC PLANT		
	OTHER		
HOME	RETREAT BUILDER		
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY	X	1.5 FTU
	CURRENT		
TEMP.	EUTHERMAL >30C		
	MESOTHERMAL 15-30C		
	OLIGOTHERMAL <15C		
	STENOTHERMAL <5C		
PH	ACIDOBIONTIC <5.5		
	ACIDOPHILIC <7.0		
	ALKALIPHILOUS >=7.0		
	ALKALIBIONTIC >8.5		
DO	DISS. OXYGEN % SAT.		
	MG/L		
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL	X	47.0
	NITRATES	X	0.03
	NITRITES		
	AMMONIA	X	0.02
	PHOSPHORUS ORTHO	X	0.03
	TOTAL	X	0.04
	SEASONAL L	X	JUNE
	DISTRIBUTION A		
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II		
	REGION III		
	REGION IV		
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX		
	REGION X		

STATES AND PROVINCES MENTIONED: MANITOBA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (178) TOT. KJ. N 0.4; TOT. ORG. C 12.9; TOT. INORG. C 9.5; TOT. HARDNESS as $CaCO_3$ 262; TRUE COLOR 10 UNITS; TOT. RESIDUE 562; FILTERABLE RESIDUE 549; NON-FILTERABLE RESIDUE LESS THAN 3; CYANIDE 0.03; Ca 85; Mg 12; K 3.6; Na 28; As LESS THAN 0.04; Cl 110; SO_4 135

BRACHYCENTRIDAE

Of the six genera and approximately thirty species of this family found in North America, we are able to draw limited profiles on four of the genera and six species. Overall, the family is rheophillic and the various species occur over a wide range of currents. Some seem to be restricted to slow moving waters, while others, such as *Brachycentrus etowahensis* Wallace are found only in swift current. All species are found in waters relatively high in oxygen and low in organic nutrients. Although most species seem to be cool adapted, if enough oxygen is present in the water, they can withstand high temperatures. Two species are found associated with thermal springs or geysers. Larvae are portable casemakers.

1. Genus *Adicrophleps* Flint

Adicrophleps is a monotypic genus found only in North America. *A. hicheocki* is known only from Connecticut, Maryland, and Pennsylvania. It is collected from shallow streams 1-10 m wide on aquatic mosses. Not enough data are available to delineate a water quality profile for this species.

2. Genus *Amiocentrus* Ross

Amiocentrus also is a monotypic genus in North America. *A. aspilus* Ross is found in larger mountain streams and small rivers with moderate current in western North America. The larvae feed on diatoms and particulate plant matter. This species readily drifts.

3. Genus *Brachycentrus* Curtis

Larvae belonging to this genus are most commonly collected in the family. Its members also seem to have the greatest habitat diversity. Some members of this genus occur fairly commonly throughout all of North America. There are nine species in this genus and we include profiles for the two larvae which are described. Larvae of this genus both filter feed and graze. With the exception of *B. etowahensis*, the larvae have a four-sided case made out of narrow strips of plant material transversely arranged around a tapered silken tube. *B. americanus* Banks is utilized as a bioassay organism, and it is one of the few larvae for which we can definitely delineate some water quality tolerances.

4. Genus *Eobrachycentrus* Wiggins

Eobrachycentrus is also a monotypic genus. *E. gelidae* Wiggins is named after the ice cold water in which it is found where the water temperature reaches only 2°C in July. This species is restricted to very cold spring mountain runs in northwestern U.S. and although we have no profile of the water quality it would not be too hard to imagine.

5. Genus *Micrasema* McLachlan

The genus *Micrasema* has approximately eighteen species in North America for which we have profiles for two, both of which have undescribed larvae. The larvae of this species are restricted to cold, highly oxygenated waters and apparently feed on periphytic algae and moss. Larvae tentatively identified as *Micrasema* have also been collected in artic lakes.

6. Genus *Oligoplectrum* McLachlan

Oligoplectrum has only one known species in the United States. The larvae of *O. echo* Ross is known only from thermal springs in California which reach temperatures of 34.4°C and smell strongly of hydrogen sulfide.

Brachycentridae *Amiocentrus aspilus* (Ross)

	SOURCE		5	165	190	241	235	275	10	NOTES OR RANGES
	PARAMETERS									
	LARVAE		X	X		X	X	X	X	
	ADULT		X		X				X	
GENERAL HABITAT	LAKE/POND									
	RIVER		X	X	X	X	X	X	X	
	STREAM							X	X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON	X					X		
	EMBENTHIC	IN						X		IN MOSS ON ROCK
	EPILITHIC	ROCK	X					X		
	EPIPHYTIC	PLANT	X					X		
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER		X					X	X	SILK OR PLANT MATERIALS
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE		X					X		
	OMNIVORE									
	DETRITIVORE							X		
	TURBIDITY		X				X			0.2 - 3.6
	CURRENT		X							0.5 - 1.0 FT/S
TEMP.	EUTHERMAL	>30C								0 - 23
	MESOTHERMAL	15-30C		X		X	X			
	OLIGOTHERMAL	<15C	X	X			X			
	STENOTHERMAL	<5C		X			X			
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0					X			6.3
	ALKALIPHILOUS	>=7.0	X	X		X	X			
	ALKALIBIONTIC	>8.5		X						8.7
DO	DISS. OXYGEN	% SAT.								
		MG/L		X		X				6.8 - 13.4
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL	X	X		X				53 - 231
	NITRATES		X	X		X	X			0.01 - 1.22
	NITRITES			X		X				0.00 - 0.11
	AMMONIA			X		X				0.00 - 2.35
	PHOSPHORUS	ORTHO	X	X		X	X			0.01 - 0.59
		TOTAL					X			0.02 - 0.86
	SEASONAL DISTRIBUTION	L	X	X		X		X		JAN. - DEC.
		A	X		X				X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II									
	REGION III									
	REGION IV									
	REGION V									
	REGION VI									
	REGION VII									
	REGION VIII			X	X	X		X		
	REGION IX							X		
	REGION X		X				X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, CO, MT, OR, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 165, 241, 235) SPEC. COND. 32 - 533; HARDNESS as $CaCO_3$ 21 - 230; NON-CARBONATE HARDNESS 0 - 10; TOT. RESIDUE 55 - 102.3; TOT. ORG. C 0.1 -5.1; TOT. KJ. N 0.03 - 0.22; Ca 6.0 - 16; F 0 - 0.6; Zn $<$0.008 - 0.039; Cu $<$0.002 - 0.024; Cd 0.00001 - 0.00016; Cl 0.2 - 10.4; Fe 0 - 0.71; Si 9.1 - 47.6; Mg 1.4 - 6.0; Na 3.0 - 8.4; K 0.4 - 1.6; CO_3 30 - 60; SO_4 3 - 12; B 0 - 0.6

(190, 235) ELEVATION 660 - 4620 FT

(235) TURBIDITY 0.3 - 23 NTU

Brachycentridae *Brachycentrus americanus* Banks

	SOURCE PARAMETERS	5	143	26	270	50	117	171	184	185	190	234	256	157	235	275	236	141					NOTES OR RANGES
	LARVAE	X	X	X	X	X	X								X	X	X	X					
	ADULT	X					X				X							X					
GENERAL HABITAT	LAKE/POND																						
	RIVER	X	X								X	X			X		X	X					
	STREAM		X				X	X	X	X			X	X									
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON	X					X										X						
	EMBENTHIC IN																						
	EPILITHIC ROCK	X															X						
	EPIPHYTIC PLANT																						
	OTHER																X	X					MUD AND SAND
HOME	RETREAT BUILDER																						
	CASE MAKER	X					X																
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE						X									X							
	DETRITIVORE						X																
	TURBIDITY	X													X		X						0 - 19
	CURRENT	X															X	X					0 - 2 FT/S
TEMP.	EUTHERMAL >30C																						0 - 26
	MESOTHERMAL 15-30C													X	X								
	OLIGOTHERMAL <15C	X	X					X					X	X	X		X						
	STENOTHERMAL <5C													X			X						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0												X										7.0
	ALKALIPHILOUS >=7.0	X	X					X					X	X	X								8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.												X										GREATER THAN 100%
	MG/L		X										X										0.4 - 17.6 ?
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL	X	X											X									53 - 233
	NITRATES	X	X											X	X								0 - 1.6
	NITRITES		X																				0 - 0.01
	AMMONIA		X																				0.01 - 0.22
	PHOSPHORUS ORTHO	X	X														X						0 - 0.57
	TOTAL		X											X	X								0 - 0.66
SEASONAL DISTRIBUTION	L	X	X				X																JAN. - DEC.
	A										X												JUNE - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V		X				X	X		X				X				X					
	REGION VI																						
	REGION VII																						
	REGION VIII										X		X				X						
	REGION IX																						
	REGION X	X							X						X	X							

STATES AND PROVINCES MENTIONED: AK, CO, ID, MI, MN, MT, OR, ONT., UT, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 143, 256, 157, 235, 236) SPEC. COND. 0 - 533; COLIFORMS LESS THAN 100 - 130 000/100 ML; FECAL COLIFORMS LESS THAN 10 TO 400/100 ML; BOD 0 - 9.4; TOTAL HARDNESS 80 - 175; Ca HARDNESS 10 - 119; Mg HARDNESS 0 - 59; NON-CARBONATE HARDNESS 0 - 10; FREE CO_2 1.0; BOUND CO_2 4.5 - 5.0; SUSP. SOLIDS 0 - 19.0; TOTAL RESIDUE 50 - 114; ORGANIC N 0.1 - 0.5; Ca 0 - 50; Mg 2.1 - 30; Na 1.0 - 9.4; K 0.3 - 2.6; Cl 1.6 - 14; SO_4 0 - 19; Fl 0 - 0.3; B 0 - 0.06; Si 9.4 - 16.0; HCO_3 32 - 78

(26) MEAN pH WHICH KILLED 50% TEST LARVAE AFTER 96 HR. EXPOSURE = 1.5, FOR 30 DAYS WAS = 2.45 pH UNITS, AND FOR 50% SUCESSFUL EMERGENCE = 4.0 UNITS

(50) 100% SURVIVAL FOR 7 DAYS WITH WATER EXPERIMENTALLY CONTROLLED Cd CONCENTRATION OF 42.5 MG/L

(171) LC_{50} FOR 3-TRIFLUOROMETHYL-4-NITROPHENOL (TFM) AT 24 HR. = 10.5 MG/L, AND AT 96 HR. = 6.6 MG/L

(185) MEAN LETHAL TEMP. AT 96 HR. EXPOSURE AFTER ACCLIMATED TO 10° C = 29° C

Brachycentridae *Brachycentrus lateralis* (Say)

	SOURCE / PARAMETERS	143	146	237	178	110	141	210	NOTES OR RANGES
	LARVAE	X	X		X	X	X	X	
	ADULT						X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER	X			X	X	X		
	STREAM			X					
	SPRING			X					
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON						X		
	EMBENTHIC IN								
	EPILITHIC ROCK						X		
	EPIPHYTIC PLANT					X			
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER							X	
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY				X				11
	CURRENT					X			0.82 - 1.68 FT/S
TEMP.	EUTHERMAL >30C								4.5 - 15.9
	MESOTHERMAL 15-30C			X					
	OLIGOTHERMAL <15C	X		X					
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0	X		X					7.1
	ALKALIBIONTIC >8.5				X				8.7
DO	DISS. OXYGEN % SAT.								
	MG/L	X		X					8.5 - 12.6
H_2O CHEMISTRY	ALKALINITY PHTH.				X				211
	TOTAL	X		X	X				26.7 - 257
	NITRATES	X	X	X	X				0.1 - 1.8
	NITRITES	X			X				<0.01
	AMMONIA	X	X						0.01 - 5.5
	PHOSPHORUS ORTHO	X	X						<0.01 - 7.10
	TOTAL	X	X						<0.01 - 7.40
	SEASONAL L	X			X			X	JUNE - SEPTEMBER
	DISTRIBUTION A							X	MAY
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV			X				X	
	REGION V	X					X	X	
	REGION VI								
	REGION VII		X						
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: IL, KY,, MI, MO, TN, MANIT., QUE.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (143, 146, 237, 178) SPEC. COND. 1600; COLOR 15 UNITS; TOTAL COLIFORMS 600 - 2100/100 ML; FECAL COLIFORMS LESS THAN 10 TO 70/100 ML; BOD 1.0 - 3.5; TOT. HARDNESS 68.0 - 443; Ca HARDNESS 51.0 - 68.0; SUSP. SOLIDS 1.0 - 9.0; FREE CO_2 2.7 - 4.5; TOT. RESIDUE 1100; FILTERABLE RESIDUE 1100; NON-FILTERABLE RESIDUE 25; Si 4.0; Fl 0.23; Cr LESS THAN 0.05; Na 200; Mg 56; SO_4 335; Cl 155; K 19; Ca 84.9

(110) LC_{50} IN PPM OF BAYTEX AT 10° C = 0.02; LC_{90} IN PPM OF BAYTEX AT 10° C = 0.04; LC_{50} IN PPM OF DDD AT 10° C = 0.02, AT 20° C = 0.03; LC_{90} IN PPM OF DDD AT 10° C = 0.09, AT 20° C = 0.09 - 0.10

Brachycentridae *Micrasema bactro Ross*

	SOURCE / PARAMETERS		120	246	5	6	209	10	NOTES OR RANGES
	LARVAE		X		X				
	ADULT				X	X	X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER		X	X	X				
	STREAM					X		X	
	SPRING			X					
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC	ON							
	EMBENTHIC	IN							
	EPILITHIC	ROCK							
	EPIPHYTIC	PLANT							
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY				X				0.2 - 3.6
	CURRENT			X	X				48 - 100 CM/S
TEMP.	EUTHERMAL	>30C							1 - 17
	MESOTHERMAL	15-30C							
	OLIGOTHERMAL	<15C		X	X	X			
	STENOTHERMAL	<5C							
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0							
	ALKALIPHILOUS	>7.0		X	X	X			7.0 - 8.1
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.							
		MG/L		X					6.2 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL			X				53 - 58
	NITRATES				X				0.01 - 0.05
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO			X				0.2 - 0.57
		TOTAL							
	SEASONAL	L							
	DISTRIBUTION	A				X	X		
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V								
	REGION VI								
	REGION VII								
	REGION VIII		X	X					
	REGION IX								
	REGION X				X	X	X	X	

STATES AND PROVINCES MENTIONED: UT, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) SPEC. COND. 92 - 118; Ca 5.9 - 8; HARDNESS 41.2 - 48.8

(246) HCO_3 140 - 185; FREE CO_2 0 - 9

(6, 209) ELEVATION 650 - 5700 FT

(10) WIDESPREAD WESTERN MONTANE SPECIES

Brachycentridae *Micrasema onisca* Ross

	SOURCE PARAMETERS		235	10	NOTES OR RANGES
	LARVAE		X	X	
	ADULT			X	
GENERAL HABITAT	LAKE/POND				
	RIVER		X		
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER			X	
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY		X		0.3 - 23 NTU
	CURRENT				
TEMP.	EUTHERMAL	>30C			2.6 - 23
	MESOTHERMAL	15-30C	X		
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C	X		
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0	X		6.3
	ALKALIPHILOUS	>=7.0	X		8.2
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES		X		<0.05 - 0.18
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO	X		<0.02 - 0.05
		TOTAL	X		0.02 - 0.86
	SEASONAL	L			
	DISTRIBUTION	A		X	MAY - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII			X	
	REGION IX			X	
	REGION X		X	X	

STATES AND PROVINCES MENTIONED: OR, CA, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 118; TOT. ORG. C 0.1 - 5.1; TOT. RESIDUE 55- 102.3; Ca-Mg HARDNESS 21 - 53; NON-CARBONATE HARDNESS 0 - 10; TOT. KJ. N 0.03 - 0.22; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 6.0 - 16; Mg 1.4 - 6.0; Na 3.0 - 8.4; K 0.4 - 1.6; HCO_3 30 - 60; Fl 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 8.5; B 0 - 0.06; ELEVATION 660 - 1500 FT

Brachycentridae *Oligoplectrum echo* Ross

	SOURCE		267	275	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X	X	
	ADULT				
GENERAL HABITAT	LAKE/POND				THERMAL STREAMS
	RIVER				
	STREAM		X	X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				ROCK FRAGMENTS
	CASE MAKER			X	
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT			X	RUNNING WATERS
TEMP.	EUTHERMAL	>30C		X	15.6 - 34.4
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C			
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0			
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L		X	JULY
	DISTRIBUTION	A			
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII		X	X	
	REGION IX		X	X	
	REGION X				

STATES AND PROVINCES MENTIONED: UT, CA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (275) CAN PERSIST IN WATERS OF TEMP. OF AT LEAST 34.4° C AND SMELLING STRONGLY OF HYDROGEN SULPHIDE

CALAMOCERATIDAE

The family Calamoceratidae is poorly represented in North America with only three genera and five species currently known. Generally the larvae are found in small streams in areas of slower current where there is an accumulation of small sticks and detritus. We have very limited profiles for two of the genera and two species.

1. Genus *Anisocentropus* McLachlan

Only one species of *Anisocentropus* occurs in the United States. *Anisocentropus pyraloides* Walk. occurs in small, sunlit streams with slow current in deciduous forest areas of the East. It makes a unique flattened leaf case formed from sections of two leaves.

2. Genus *Heteroplectron* McLachlan

Two species of this genus occur in North America, one western *H. californicum* McL. and one eastern, *H. americanum* Walk. These species are characteristic of pool areas of cool rapid streams. The larvae burrow into twigs and bark and utilize the dead wood for a shelter. They apparently feed on dead plant material and leaf fragments.

3. Genus *Phylloicus* Müller

Two species of this genus are known to occur only in the southwestern states. *P. ornatus* Banks and *P. aeneus* Banks build their cases from large heavy leaf sections or flattened bark and are restricted to small, cool streams in Regions VI and IX and even are collected at artesian well sites. *P. aeneus* is the more westernly distributed of the two species. We do not have sufficient water quality data for a profile of these species.

Calamoceratidae *Anisocentropus pyraloides* (Walker)

	SOURCE		210	249	275	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X	X	X	
	ADULT			X		
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM			X	X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON		X	X	
	ENBENTHIC	IN	X			
	EPILITHIC	ROCK		X	X	
	EPIPHYTIC	PLANT	X	X	X	
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X	X	X	LEAF PIECES
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE			X	X	
	TURBIDITY			X		0 - 44
	CURRENT			X		SLOW TO MODERATE
TEMP.	EUTHERMAL	>30C				5 - 24
	MESOTHERMAL	15-30C		X		
	OLIGOTHERMAL	<15C		X		
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5		X		4.9
	ACIDOPHILIC	<7.0		X		
	ALKALIPHILOUS	>=7.0		X		7.5
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L		X		4.7 - 11.8
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		10 - 40
	NITRATES			X		0.005 - 0.436
	NITRITES			X		0 - 0.11
	AMMONIA			X		0 - 0.11
	PHOSPHORUS	ORTHO		X		0 - 0.58
		TOTAL				
	SEASONAL	L			X	MARCH
	DISTRIBUTION	A		X		MAY
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III				X	
	REGION IV			X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: DE, GA, FL, SC, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (249) SPEC. COND. 15 - 45; SO_4 0 - 6; ELEVATION 40 - 1000 FT. CASE CONSISTS OF TWO LEAVES OR PIECES OR LEAVES STUCK TOGETHER (275) DECIDUOUS FOREST STREAMS

Calamoceratidae *Heteroplectron californicum* McLachlan

	SOURCE		5	6	235	282	275	NOTES OR RANGES
	PARAMETERS							
	LARVAE		X		X	X	X	
	ADULT		X	X				
GENERAL HABITAT	LAKE/POND					X		(275) POOLS OF STREAM
	RIVER		X		X			
	STREAM			X			X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON				X	X	
	EMBENTHIC	IN		X				
	EPILITHIC	ROCK					X	
	EPIPHYTIC	PLANT		X		X	X	
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER						X	HOLLOW TWIG
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE					X	X	
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY		X		X			0.2 - 23
	CURRENT		X					71 CM/S
TEMP.	EUTHERMAL	>30C						2.6 - 23
	MESOTHERMAL	15-30C			X			
	OLIGOTHERMAL	<15C	X	X	X			
	STENOTHERMAL	<5C			X			
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0			X			6.3
	ALKALIPHILOUS	>=7.0	X	X	X			8.2
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.						
		MG/L						
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL	X					53 - 58
	NITRATES		X		X			0.01 - 0.18
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO	X		X			<0.02 - 0.57
		TOTAL			X			0.02 - 0.86
	SEASONAL	L				X	X	AUGUST - OCTOBER
	DISTRIBUTION	A		X				MAY - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX						X	
	REGION X		X	X	X			

STATES AND PROVINCES MENTIONED: BRIT. COL., OR CALIFORNIA NORTH TO BRITISH COL.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 235) SPEC. COND. 32 - 118; TOT. KJ. N 0.03 - 0.22; TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; Ca-Mg HARDNESS 21 - 53; NON-CARBONATE HARDNESS 0 - 10; TOT RESIDUE 55 - 102.3; TOT. ORG. C 0.1 - 5.1; Ca 5.9 - 16; Si 9.1 - 47.6; Fe 0 - 0.71; Mg 1.4 - 6.0; Na 3.0 - 8.4; K 0.4 - 1.6; HCO_3 30 - 60; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 8.5; B 0 - 0.6

(6, 235) ELEVATION 60 - 1500 FT

GLOSSOSOMATIDAE

There are six genera and approximately eighty species of glossosomatids in North America. Of these, we are able to delineate water quality profiles for only five genera and fifteen species. Glossosomatids are traditionally lotic, but are also collected from wave swept shores of large lakes. Larvae are encountered in "saddle" or "turtle shell" like cases made up of small stones from which the anterior and posterior segments may be protruded for movement and feeding. Most appear to be grazers, feeding on algae, diatoms, and detritus on rocks.

1. Genus Agapetus Curtis

The members of this genus number about thirty in North America north of Mexico. However, we are only able to find information which correlated water quality and species abundance for two species. Part of the problem is that there are currently no larval keys available to the species of this genus, and only four larvae have been described. The members of this genus are locally abundant in small, cool streams.

2. Genus Anagapetus Ross

Only six species of this genus occur and only four of the six have larvae which are known. We do not have water quality data associated with any of the species. No key exists to larvae of this genus which is restricted to cooler brook-type streams in the western montane states.

3. Genus Culoptila Mosely

Four species of this genus are known from North America; of these four, only one larvae has been described. Specimens of this genus are collected from rather warm, silt-laden rivers suggesting that it may have rather unique water quality requirements for the family. However, not enough data is available to draw up a water quality profile.

4. Genus Glossosoma Curtis

The western mountains of North America provide habitat for all but three of the neartic representatives of this genus. Although there are no larval keys available for this genus, we have profiles for nine species, based on associated and/or adult specimens. Members of this genus seem to be restricted to "trout" waters, cold and highly oxygenated where they graze on periphytic algae and detritus.

5. Genus *Matrioptila* Ross

A very minimal water quality profile is all that could be completed for this monotypic genus. *Matrioptila jeanae* Ross is found only in Region IV at high elevations in cold mountain streams.

6. Genus *Protoptila* Banks

Although approximately thirteen species of this genus are found in North America, we have incomplete profiles for only three species. More widely distributed than other glossosomatids, these species occur in warmer, slower waters throughout the central and southwestern states. Usually this genus can be distinguished by the two relatively large stones which it utilizes to form the sides of its case.

Glossosomatidae *Agapetus illini* Ross

	SOURCE / PARAMETERS	210	98	146	259	245	275	NOTES OR RANGES
	LARVAE	X	X	X			X	
	ADULT	X			X	X		
GENERAL HABITAT	LAKE/POND							
	RIVER		X			X		
	STREAM	X			X	X		
	SPRING							
	TEMP. WATERS	X					X	
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN							
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER						X	ROCK FRAGMENTS
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY		X					<5
	CURRENT							
TEMP.	EUTHERMAL >30C							6
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C		X					
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0			X				8.0
	ALKALIBIONTIC >8.5		X					8.7
DO	DISS. OXYGEN % SAT.		X					93
	MG/L		X	X				11.0 - 15.6
H_2O CHEMISTRY	ALKALINITY PHTH.		X					11
	TOTAL		X	X				130 - 146
	NITRATES		X	X				0.40 - 1.6
	NITRITES		X					0.005
	AMMONIA		X	X				0.40
	PHOSPHORUS ORTHO		X	X				0.03 - 0.10
	TOTAL			X				0.08
	SEASONAL L	X						MAY
	DISTRIBUTION A	X			X	X		MARCH - JULY
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV	X						
	REGION V	X			X			
	REGION VI	X				X		
	REGION VII	X	X	X				
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: AR, IL, KY, MO, OK

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (98, 146) Mg HARDNESS as $CaCO_3$ 18; Ca HARDNESS as $CaCO_3$ 32.0 - 133; TOT. HARDNESS as $CaCO_3$ 146; SPEC. COND. 290 - 300; COD 0; DETERGENTS as ABS 0.0; COLIFORMS 14/100 ML; FECAL STREPTOCOCCI 10/100 ML; COLOR 2 UNITS; Fe 0.02; Mn 0.00; SO_4 7.4; Si 2.5 - 9.9; Na 0.9 - 5.5; K 1.1 - 3.1; Cl 3.9 - 6.8; F 0.0 - 0.32

Glossosomatidae *Agapetus tako* Ross

	SOURCE / PARAMETERS		10	256	NOTES OR RANGES
	LARVAE			X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER		X		
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE		X		
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			12 - 14.5
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0		X	7.0 - 7.1
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.		X	ALWAYS >100%
		MG/L		X	10.1
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL DISTRIBUTION	L			
		A	X		AUGUST - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII			X	
	REGION IX		X		
	REGION X		X		

STATES AND PROVINCES MENTIONED: CA, CO, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (256) FREE CO_2 1.0; BOUND CO_2 4.5 - 5.0

Glossosomatidae *Glossosoma califica* Denning

	SOURCE	69	10	235	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X		
	ADULT	X	X		
GENERAL HABITAT	LAKE/POND				
	RIVER			X	
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER		X		
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE		X		
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	0.3 - 180 NTU
	CURRENT				
TEMP.	EUTHERMAL >30C				2.6 - 26
	MESOTHERMAL 15-30C			X	
	OLIGOTHERMAL <15C			X	
	STENOTHERMAL <5C			X	
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0			X	6.0
	ALKALIPHILOUS >=7.0			X	8.2
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL				
	NITRATES			X	<0.05 - 0.5
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO			X	<0.02 - 0.05
	TOTAL			X	0.02 - 0.86
	SEASONAL L		X		JUNE
	DISTRIBUTION A	X	X		JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX	X	X		
	REGION X		X	X	

STATES AND PROVINCES MENTIONED: CA, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 3.0 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06

Glossosomatidae *Glossosoma excitum* Ross

	SOURCE / PARAMETERS	5	10	NOTES OR RANGES
	LARVAE	X		
	ADULT	X	X	
GENERAL HABITAT	LAKE/POND			
	RIVER	X		
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER	X	X	
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE		X	
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		0.2 - 3.6
	CURRENT	X		71 CM/S
TEMP.	EUTHERMAL >30C			6 - 13.5
	MESOTHERMAL 15-30C			
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		7.3 - 7.6
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		53 - 58
	NITRATES	X		0.01 - 0.05
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO	X		0.2 - 0.57
	TOTAL			
	SEASONAL L			
	DISTRIBUTION A		X	JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII		X	
	REGION IX			
	REGION X	X	X	

STATES AND PROVINCES MENTIONED: MT, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM; MEAN WIDTH 30.5 M; SOLIDS 90 - 114

Glossosomatidae *Glossosoma intermedium* (Klapalek)

	SOURCE / PARAMETERS	210	146	275	NOTES OR RANGES
	LARVAE	X	X	X	
	ADULT	X			
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM				
	SPRING	X			
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER	X			
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL >30C				
	MESOTHERMAL 15-30C				
	OLIGOTHERMAL <15C				
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0				
	ALKALIPHILOUS >=7.0		X		8.0
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L		X		10.9 - 11.6
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL		X		168
	NITRATES		X		0.6
	NITRITES				
	AMMONIA		X		<0.1
	PHOSPHORUS ORTHO		X		0.02 - 0.03
	TOTAL		X		0.05
	SEASONAL L				
	DISTRIBUTION A				
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V	X			
	REGION VI				
	REGION VII	X	X		
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: IL, MN, MO. EASTERN AND CENTRAL PARTS OF NORTH AMERICA TO BRITISH COLUMBIA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (146) SPEC. COND. 300; COD 2; Ca HARDNESS as $CaCO_3$ 36.6; TOT. HARDNESS as $CaCO_3$ 155; Fe <0.1; Na 1.0; K 1.4; Mn <1.0; Si 6.3; F 0.50 - 0.67; Cl 4.1 - 9; SO_4 7 - 14

Glossosomatidae   *Glossosoma montana* Ross

	SOURCE / PARAMETERS		5	10	155	NOTES OR RANGES
	LARVAE		X		X	
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER		X	X	X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X	X		
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY			X		0.2 - 3.6
	CURRENT			X		71 CM/S
TEMP.	EUTHERMAL	>30C				2.6 - 26
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C		X		
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0		X		7.3 - 7.6
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		53 - 58
	NITRATES			X		0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO		X		0.2 - 0.57
		TOTAL				
	SEASONAL DISTRIBUTION	L		X	X	JULY - OCTOBER
		A		X		JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII			X	X	
	REGION IX					
	REGION X		X	X		

STATES AND PROVINCES MENTIONED: ID, MT, OR, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM; MEAN WIDTH 30.5 M; SOLIDS 90 - 114

(155) FOUND IN RIFFLE AREA WITH RAPID WATER LEVEL FLUCUATIONS BECAUSE BELOW JACKSON LAKE DAM

Glossosomatidae *Glossosoma nigrior* Banks

	SOURCE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]													NOTES OR RANGES
	PARAMETERS																						
	LARVAE		X		X		X		X	X													
	ADULT	X		X		X		X															
GENERAL HABITAT	LAKE/POND																						(239) TROUT STREAM
	RIVER					X	X																
	STREAM		X		X	X			X	X													
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER								X														ROCK FRAGMENTS
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE								X														
	OMNIVORE																						
	DETRITIVORE								X														
	TURBIDITY			X																			0.5 - 1.1
	CURRENT																						
TEMP.	EUTHERMAL >30C																						0 - 24.5
	MESOTHERMAL 15-30C						X																
	OLIGOTHERMAL <15C						X																
	STENOTHERMAL <5C						X																
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0		X	X						X													6.0
	ALKALIPHILOUS >=7.0						X																8.2
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.			X			X																75 - 130
	MG/L			X																			6.7 - 12.4
H_2O CHEMISTRY	ALKALINITY PHTH.			X						X													0.0 - 5.2
	TOTAL						X			X													5.0 - 150
	NITRATES		X	X																			SEE COMMENTS
	NITRITES			X																			SEE COMMENTS
	AMMONIA		X																				0.003 MEQ/L
	PHOSPHORUS ORTHO		X	X																			SEE COMMENTS
	TOTAL																						
	SEASONAL L		X		X					X													JAN. - DEC.
	DISTRIBUTION A	X				X																	MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I	X																					
	REGION II																						
	REGION III																						
	REGION IV				X					X													
	REGION V					X	X																
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: ME, NH, NC, NEW BRUNS., NEW FOUND., ON, QUE. NORTHEAST AND WEST TO MINNESOTA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.78; REST IN MEQ/L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; NH_4 0.003; HCO_3 0.235; SO_4 0.052; Cl 0.025; NO_3 0.007; H_2PO_4 <0.001

(167, 227) TOT. HARDNESS as $CaCO_3$ 9.0 - 250; ORTHO PO_4 0.01 - 0.13; NO_2 + NO_3 0 - 0.14; TOT. ORG. C 5 - 13; SPEC. COND. 17 - 32; FREE CO_2 0.0 - 10.0; TOT. COLIFORMS 2 - 323 PER 100 ML; Cl 30 - 120; STREAM AVG. WIDTH 4 - 13 METERS

(233) ELEVATION 4000 FT

(265) COMMON IN EASTERN NORTH AMERICA

Glossosomatidae *Glossosoma penitum* Banks

	SOURCE / PARAMETERS		8	6	10	217	275	NOTES OR RANGES
	LARVAE		X				X	
	ADULT		X	X	X	X		
GENERAL HABITAT	LAKE/POND							
	RIVER							
	STREAM		X	X	X	X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON	X					
	EMBENTHIC	IN						
	EPILITHIC	ROCK	X					
	EPIPHYTIC	PLANT						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER		X		X		X	
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE		X	X	X			
	OMNIVORE							
	DETRITIVORE		X	X				
	TURBIDITY							
	CURRENT							
TEMP.	EUTHERMAL	>30C						10.6 - 14.2
	MESOTHERMAL	15-30C						
	OLIGOTHERMAL	<15C		X				
	STENOTHERMAL	<5C						
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0						
	ALKALIPHILOUS	>=7.0		X				7.0
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.						
		MG/L						
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL						
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO						
		TOTAL						
	SEASONAL	L	X					JAN. - DEC.
	DISTRIBUTION	A	X	X	X			FEB. - DEC.
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X		X	X	X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (8) 200 METER ELEVATION
(6, 10) ELEVATION 225 - 4500 FT

Glossosomatidae *Glossosoma traviatum* Banks

	SOURCE PARAMETERS	100	190	235	NOTES OR RANGES
	LARVAE	X	X	X	
	ADULT	X			
GENERAL HABITAT	LAKE/POND				
	RIVER		X	X	
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER	X			
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE	X			
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	0.3 - 180 NTU
	CURRENT				
TEMP.	EUTHERMAL >30C				2.6 - 26
	MESOTHERMAL 15-30C			X	
	OLIGOTHERMAL <15C			X	
	STENOTHERMAL <5C			X	
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0			X	6.0
	ALKALIPHILOUS >=7.0			X	8.2
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL				
	NITRATES			X	<0.05 - 0.5
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO			X	<0.02 - 0.05
	TOTAL			X	0.02 - 0.86
	SEASONAL L	X	X		JUNE - AUGUST
	DISTRIBUTION A	X			APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII	X	X		
	REGION IX				
	REGION X	X		X	

STATES AND PROVINCES MENTIONED: ID, MT, OR, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0.0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 3.0 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06; (235, 190) ELEVATION 360 - 5110 FT

Glossosomatidae *Glossosoma velona* Ross

	SOURCE	41	10	190	217	NOTES OR RANGES
	PARAMETERS					
	LARVAE			X		
	ADULT	X			X	
GENERAL HABITAT	LAKE/POND					
	RIVER	X	X	X	X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					0 - 18
	MESOTHERMAL 15-30C	X				
	OLIGOTHERMAL <15C	X				
	STENOTHERMAL <5C	X				
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0	X				7.4 - 8.0
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL					
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL					
	SEASONAL L			X		MAY - OCTOBER
	DISTRIBUTION A	X				APRIL - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII		X	X		
	REGION IX					
	REGION X		X			

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., ID, MT, N.W. TERR., OR, UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (190) ELEVATION 2640 - 5110 FT

(10) LARGE, SLOW FLOWING RIVERS

(217) WIDESPREAD THROUGH WESTERN MONTANE REGION

Glossosomatidae *Glossosoma ventrale* Banks

	SOURCE		280	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	0
	CURRENT			
TEMP.	EUTHERMAL	>30C		9
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0	X	7.8
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL	X	101
	NITRATES		X	0.21
	NITRITES			
	AMMONIA		X	<0.01
	PHOSPHORUS	ORTHO	X	0.036
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	FEBRUARY
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII		X	
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (280) SALINITY 0 PPT; HCO_3 123; B 80 µG/L; Ca 26 µG/L; CO_3 <1; Cl 5; SPEC. COND. 228; HARDNESS as $CaCO_3$ 104; OH <0.1; Mg 10; LAB TEST OF pH 8.2; K 1.4; Na 8.5; SO_4 3; TOT. DISS. SOLIDS 124 @ 180 °C; TOT. COLIFORMS 39/100 ML; FECAL COLIFORMS 4/100 ML

Glossosomatidae *Matrioptila jeanae* (Ross)

	SOURCE		275	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER		X	ROCK PARTICLES
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE		X	
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		COLD
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L	X	MAY(FINAL INSTAR)
	DISTRIBUTION	A	X	JUNE
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV		X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: GA, KY, NC, SC, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (275) MOUNTAINOUS AREAS OF THE SOUTHEAST, IN COLD MOUNTAIN STREAMS

Glossosomatidae *Protoptila coloma* Ross

	SOURCE		235	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT			
GENERAL HABITAT	LAKE/POND			
	RIVER		X	
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	0.5 - 180 NTU
	CURRENT			
TEMP.	EUTHERMAL	>30C		4.8 - 26
	MESOTHERMAL	15-30C	X	
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0	X	6.3
	ALKALIPHILOUS	>=7.0	X	8.2
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES		X	<0.05 - 0.5
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO	X	<0.02 - 0.03
		TOTAL	X	0.02 - 0.86
	SEASONAL	L		
	DISTRIBUTION	A		
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X		X	

STATES AND PROVINCES MENTIONED: OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 36 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0 - 0.63; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.2; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 10; Cl 1.2 - 14; B 0 - 0.06

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Glossosomatidae *Protoptila lega* Ross

	SOURCE		210	146	259	245	NOTES OR RANGES
	PARAMETERS						
	LARVAE			X			
	ADULT		X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER		X			X	
	STREAM		X				
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0		X			8.0
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L		X			11.6
H$_2$O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL		X			168
	NITRATES			X			0.10 - 1.0
	NITRITES						
	AMMONIA			X			0.1 - 0.18
	PHOSPHORUS	ORTHO		X			0.02 - 0.10
		TOTAL		X			0.05 - 0.15
	SEASONAL	L					
	DISTRIBUTION	A			X	X	APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V		X		X		
	REGION VI					X	
	REGION VII		X	X			
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, IL, MO, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (146) SPEC. COND. 300; COD 2; Ca HARDNESS as $CaCO_3$ 36.6; TOT. HARDNESS as $CaCO_3$ 155; F 0.50; Cl 4.1; SO_4 7; Fe <0.1; Na 1.0; K 1.4; Mn <1.0; Si 6.3

Glossosomatidae *Protoptila maculata* (Hagen)

	SOURCE	210	36	146	183	245	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X		X			
	ADULT	X	X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X					
	STREAM						
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER	X					
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL >30C						
	MESOTHERMAL 15-30C						
	OLIGOTHERMAL <15C						
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0						
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L						
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL						
	NITRATES			X			0.35
	NITRITES						
	AMMONIA			X			<0.10
	PHOSPHORUS ORTHO			X			0.10
	TOTAL			X			0.12
	SEASONAL L						
	DISTRIBUTION A		X			X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X				
	REGION II	X			X		
	REGION III	X					
	REGION IV	X					
	REGION V	X					
	REGION VI					X	
	REGION VII			X			
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, DC, IL, IN, KY, MO, NH, NY, PA

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

HELICOPSYCHIDAE

The snail shell caddisflies are widely distributed throughout North America. Four species belonging to one genus, *Helicopsyche*, occur north of Mexico. The larvae of only one of these four species, *Helicopsyche borealis* Hagen, is described. It has a wide distribution and is probably one of the best known caddisflies. We include a profile only for this species. The other three species, *H. limnella* Ross, *H. mexicana* Banks, and *H. piroa* Ross are found only in Region VI. Larvae are found most commonly in clear, lotic habitats, although they are reported from lakes in up to ten feet of water. Larvae are grazers-scrapers of rock surfaces and have a wide temperature tolerance. Most generally, they are found under stones and they have been collected up to 30 cm below the stream bed.

Helicopsychidae *Helicopsyche borealis* (Hagen)

	SOURCE	120	41	82	13	132	146	148	190	193	234	241	279	280	62	235	25	167	245	275	114	141	NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X	X		X	X	X	X		X		X			X	X	X			X	X	X	
	ADULT	X								X				X				X	X				
GENERAL HABITAT	LAKE/POND																			X			
	RIVER	X	X		X	X			X		X	X	X	X		X	X	X	X		X	X	
	STREAM									X				X	X		X		X				
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																X					X	
	EMBENTHIC IN																						
	EPILITHIC ROCK																					X	
	EPIPHYTIC PLANT																						
	OTHER																					X	SAND
HOME	RETREAT BUILDER																						
	CASE MAKER																X						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																			X			
	DETRITIVORE																						
	TURBIDITY				X			X						X		X							0 - 18
	CURRENT																					X	0.13 - 2.29 FT/S
TEMP.	EUTHERMAL >30C																			X			0 - 34
	MESOTHERMAL 15-30C		X		X	X								X		X	X	X					
	OLIGOTHERMAL <15C		X		X			X				X		X		X		X					
	STENOTHERMAL <5C													X		X		X					
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0		X													X					X		6.5
	ALKALIPHILOUS >=7.0		X		X	X	X	X				X		X		X	X	X			X		8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.				X													X					62 - 122
	MG/L				X	X	X	X				X		X									2.3 - 12.0
H_2O CHEMISTRY	ALKALINITY PHTH.				X																		0 - 8
	TOTAL				X		X	X				X		X		X							40 - 232
	NITRATES				X	X	X	X				X		X		X							0.05 - 3.4
	NITRITES				X	X						X											0.000 - 0.020
	AMMONIA				X	X	X					X		X	X								0.01 - 1.75
	PHOSPHORUS ORTHO				X		X	X				X		X		X							0.0 - 1.1
	TOTAL					X	X									X							0.02 - 0.86
	SEASONAL DISTRIBUTION L				X	X		X				X					X			X			MARCH - DECEMBER
	A	X												X					X				JAN. - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I																			X	X		
	REGION II																			X			
	REGION III																			X			
	REGION IV																X			X			
	REGION V					X		X										X		X		X	
	REGION VI																		X	X			
	REGION VII				X		X													X			
	REGION VIII	X							X			X	X	X						X			
	REGION IX			X																X			
	REGION X															X				X			

STATES AND PROVINCES MENTIONED: AR, BAJA CALIF., FL, MI, MO, MT, OH, ONT., N.W. TERR., SASK., UT, WI, WY MOST OF NORTH AMERICA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M^3 Ca 170 - 3800; Mg 70 - 2100; Na 10 - 5200; K 10 - 60; SO_4 70 - 2200; HCO_3 880 -.8100; Cl LESS THAN 10 TO 300; N 9.2 - 98; P LESS THAN 0.05 TO 3.4; Si 31 - 270; Fe 0.20 - 16; Mn LESS THAN 0.10 TO 1.7; Zn 0.02 - 0.40; Cu LESS THAN 0.03 - 0.47; Pb LESS THAN 0.01 TO 0.02; Cd LESS THAN 0.01 TO 0.01

(13, 132, 146, 148, 241, 280, 62, 235, 167) SPEC. COND. 32 - 875; COLIFORMS, TOTAL 0 - 325/100 ML; COLIFORMS, FECAL 23 - 93/100 ML; TOT HARDNESS as $CaCO_3$ 115 - 334; Ca HARDNESS as $CaCO_3$ 30.4 - 40.8; NON-CARBONATE HARDNESS as $CaCO_3$ 0 - 10; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; TOT. KJ. N 0.03 - 0.26; FREE CO_2 0.0 - 8.5; TOT. SOLIDS 193 - 290; SUSP. SOLIDS 28; DISS. SOLIDS 274 - 522; BOD 2.6; SALINITY 0.5 PPT.; DETERGENTS as ABS 0.0 - 0.2; ORGANIC N 1.21 - 6.43; Ca 5.4 - 129; Mg 1.4 - 138; Si 2.9 - 47.6; Fe 0 - 0.90; Na 0.8 - 95; K 0.4 - 12.7; Fl 0 - 0.69; SO_4 1.2 - 180; Cl 1 - 100; b 0 - 0.6; Mn 0.02 - LESS THAN 1.0; Cd 0.00001 - 0.003; Pb 0.03; Ni 0.02; Cu 0.003 - 0.01; Al 0.05; Cr 0.005; Zn 0.017

(235) TURBIDITY 0.3 - 180 NTU

HYDROPSYCHIDAE

The Hydropsychidae are the most abundant caddisflies in eastern North America. There are thirteen genera and 142 species known from North America of which we have water quality profiles on only eight genera and fifty-seven species. All hydropsychids filter feeders which spin nets perpendicular to the current to collect food for ingestion and graze from a fixed retreat. Easily identified to family, and often very numerous, they occur in lotic habitats. Some are reported from lakes where there is a nearly constant current caused by wave action. Some species of this family such as Arctopsyche irrorata Banks have a very narrow tolerance to changes in water quality, while others, such as Potamyia flava Banks seem to have a very wide tolerance range. Complete water quality profiles, coupled with good taxonomic keys for this family are sorely needed by the practicing water pollution biologist.

1. Genus Aphropsyche Ross

No water quality data is available for this genus which has only two species that occur in eastern North America. Larvae that are assumed to belong to this genus are collected from small headwater streams in the eastern and midwestern states although no adults have been definitely associated for this genus.

2. Genus Arctopsyche McLachlan

The four species of Arctopsyche that occur in North America are restricted to cold, torrential streams. The larvae of three species of this large hydropsychid are described. The larvae feed primarily on other insects which they entrap in their rather coarse nets. No species are found in the midwestern states.

3. Genus Cheumatopsyche Wellengren

Approximately forty species of this genus occur in North America. We have included water quality profiles for seventeen species. All these profiles are based on adult distribution or associated material as no key to Cheumatopsyche larvae exists. Cheumatopsyche seems to be the most widely tolerant rheophillic genus we encountered. It occurs abundantly throughout North America in almost all lotic habitats, and is known from depths up to . 20 cm below a stream bed. Widely tolerant, specimens of this genus are known to tolerate more dieldrin in their bodies' fat than any other insects.

4. Genus Diplectrona Westwood

There are currently three described species of this genus in the United States. The larvae are known for Diplectrona modesta and Diplectrona metaqui Ross. Diplectrona californica Flint is known from only California while the other two species are primarily eastern. The larvae are restricted to springs and/or small highly oxygenated streams. We have a water quality profile for only one species, D. modesta.

5. Genus Homoplectra Ross

This genus is restricted to western mountains of North America. Adults of eight species are known. The larvae are collected only from cold mountain trickles. No data are available for a profile.

6. Genus Hydropsyche Pictet

This is the largest genus of the Hydropsychidae with nearly seventy North American species. Members of this genus are widespread and individual species have rather varied water quality tolerances. We have profiles on nineteen species . Most species are lotic, although some may be found in lakes where current is maintained by wave action. Individual species seem to be restricted to rather finite conditions of water quality, though the genus is represented in habitats ranging from small, clear springs to silt laden rivers.

7. Genus Leptonema Guérin-Méneville

Larvae of this genus are known only from Region V. No water quality data is associated with their distribution in the United States. This genus is apparently restricted in the United States to a region along the southeastern border of Texas.

8. Genus Macronema Pictet

Three species of this genus occur in eastern North America. We have some water quality data for three species and include brief water quality profiles for only one species. It is thought that the species in this genus may be more influenced by feeding habits than water quality parameters. Efficient net spinners, Macronema feed primarily on diatoms from specialized retreats. Their distribution seems to be restricted to larger rivers.

9. Genus Oropsyche Ross

Only one species Oropsyche howellae Ross is known and it is only collected in North Carolina. Larvae, believed to be of this genus, are collected from a small cool mountain stream. No water quality data are available for this species.

10. Genus Parapsyche Betten

Seven species of this genus are known from North America, of which four are described. We include information on two species, one western and one eastern species. Larvae are restricted to clear, cold streams and rivers with fairly strong current. They are not found in slower warmer streams of the South and Midwest.

11. Genus Potamyia Banks

Larvae of this monotypic genus inhabit large warm water rivers and are probably the most common caddisfly species in the Midwest. Locally abundant and even reaching nuisance levels, it is not recorded from the Northeast or far West. It seems to have a wide tolerance range and is one of the few caddisflies that can be found in the channels of larger rivers.

12. Genus Smicridea McLachlan

The four species of this genus found in the United States are limited in distribution to the southwestern states. Like other hydropsychids, it is limited to warm water lotic situations where it filter feeds. We have very limited data on Smicridea fasciatella Ross and do not include profiles on any species. Diagnostic characters are known, however, for three of the four species.

13. Genus Symphitopsyche Ulmer

This genus includes those species of the Hydropsychidae that were formerly included in the Hydropsyche bifida group of Ross (1944). The larvae can be separated by their distinctive markings on the head capsule and the scale-like hairs and setae on the abdomen. Most of the species in this genus seem to be restricted to lotic environments where the temperature does not reach 25°C. We have profiles for thirteen species of this genus.

Hydropsychidae Arctopsyche grandis (Banks)

	SOURCE / PARAMETERS		120	246	5	2	127	125	165	190	202	247	235	253	217	275	236	VALUE OF RANGES
	LARVAE		X			X		X	X	X	X	X	X	X		X	X	
	ADULT		X	X	X			X							X			
GENERAL HABITAT	LAKE/POND																	
	RIVER		X	X	X		X	X	X	X			X				X	
	STREAM		X			X		X			X	X						
	SPRING																	
	TEMP. WATERS																	
SPECIFIC HABITAT	EPIBENTHIC	ON	X					X						X			X	
	EMBENTHIC	IN																
	EPILITHIC	ROCK	X											X			X	
	EPIPHYTIC	PLANT						X										
	OTHER																	
HOME	RETREAT BUILDER													X		X		
	CASE MAKER																	
	FREELIVING																	
DIET	CARNIVORE																	
	HERBIVORE																	
	OMNIVORE					X								X				
	DETRITIVORE													X				
	TURBIDITY				X							X	X				X	0.2 - 19
	CURRENT			X	X							X					X	30 - 100 CM/S
TEMP.	EUTHERMAL	>30C																0 - 24
	MESOTHERMAL	15-30C					X		X		X	X	X					
	OLIGOTHERMAL	<15C		X	X		X		X			X	X		X		X	
	STENOTHERMAL	<5C		X			X		X									
PH	ACIDOBIONTIC	<5.5																
	ACIDOPHILIC	<7.0										X	X					6.0
	ALKALIPHILOUS	>=7.0		X	X		X		X		X	X	X					
	ALKALIBIONTIC	>8.5					X		X									8.81
DO	DISS. OXYGEN	% SAT.																
		MG/L		X			X		X									6.8 - 13.4
H_2O CHEMISTRY	ALKALINITY	PHTH.																
		TOTAL			X		X		X		X		X				X	3.2 - 231
	NITRATES				X		X		X					X				0.01 - 1.88
	NITRITES						X		X									0.00 - 0.11
	AMMONIA						X		X				X					0.00 - 2.33
	PHOSPHORUS	ORTHO			X		X		X				X	X			X	0.01 - 1.21
		TOTAL												X				0.02 - 0.8
	SEASONAL DISTRIBUTION	L	X			X		X	X	X	X	X		X				JAN. - DEC.
		A	X	X				X										APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I																	
	REGION II																	
	REGION III																	
	REGION IV																	
	REGION V																	
	REGION VI							X								X		
	REGION VII																	
	REGION VIII		X	X		X	X	X	X	X		X		X		X	X	
	REGION IX							X								X		
	REGION X				X			X			X		X			X		

STATES AND PROVINCES MENTIONED: ALB., CA, CO, ID, MT, NM, OR, QUE., UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (246, 5, 127, 165, 202, 247, 235, 236) FREE CO_2 0; HARDNESS as $CaCO_3$ 41.2 - 230; Ca HARDNESS 40 - 159; Mg HARDNESS 0 - 59; Ca-Mg HARDNESS 22 - 53; NON-CARBONATE HARDNESS 0 - 10; SPEC. COND. 32 - 533; TOT. KJ. N 0.03 - 0.19; TOT. RESIDUE 55.0 - 102.3; TOT. ORG. C 0.1 - 5.1; HCO_3 30 - 174; Ca 2.00 - 18; SO_4 0 - 14; Cl 0 - 54.6; Fe 0.05 - 4.08; Zn < 0.008 - 0.038; Cu < 0.002 - 0.024; Cd 0.00001 - 0.00016; F 0 - 0.28; B 0 - 0.06; Na 1.04 - 22.99; Mg 0.00 - 6.0; K 0.05 - 11.73; Mn 0.00 - 0.46; Si 58.6 - 86.0

(247) TURBIDITY 0.3 - 16.0 NTU

(217) WIDESPREAD THROUGHOUT WESTERN MONTANE REGIONS

Hydropsychidae *Arctopsyche irrorata* Banks

	SOURCE		130	244	253	275	NOTES OR RANGES
	PARAMETERS						
	LARVAE			X	X	X	
	ADULT				X		
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM		X	X	X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER				X	X	
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE				X		
	DETRITIVORE				X		
	TURBIDITY						
	CURRENT				X		50 - 127 CM/S
TEMP.	EUTHERMAL	>30C					1 - 19
	MESOTHERMAL	15-30C	X				
	OLIGOTHERMAL	<15C	X	X			
	STENOTHERMAL	<5C	X	X	X		
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0		X			5.9 - 6.9
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L	X	X			7.4 - 11.9
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL	X	X			ND - 20
	NITRATES		X				0.00 - 0.53
	NITRITES		X				0.00 - 0.01
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL	L			X		APRIL - OCTOBER
	DISTRIBUTION	A			X		APRIL - MAY
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV		X	X	X	X	
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED:GA, NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(244) SPEC. COND. 10 - 51; PHTH. ACIDITY as $CaCO_3$ 1.5 - 4.5; TOT. HARDNESS as $CaCO_3$ 8.0 - 28.0; SO_4 ND - 3.7

(253) MEDIUM AND LARGE STREAMS AT HIGHER ELEVATIONS IN SOUTHERN APPALACHIANS

Hydropsychidae *Cheumatopsyche aphanta* Ross

	SOURCE PARAMETERS	210	146	167	245	129	NOTES OR RANGES
	LARVAE						
	ADULT	X	X	X	X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER				X		
	STREAM	X			X		
	SPRING	X					
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL >30C						
	MESOTHERMAL 15-30C						
	OLIGOTHERMAL <15C						
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0		X				8.0
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L		X				11.0
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL		X				130
	NITRATES		X				0.40
	NITRITES						
	AMMONIA		X				<0.1
	PHOSPHORUS ORTHO		X				0.03
	TOTAL		X				0.08
	SEASONAL L						
	DISTRIBUTION A	X			X	X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II					X	
	REGION III						
	REGION IV						
	REGION V	X		X		X	
	REGION VI	X			X	X	
	REGION VII		X			X	
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, IL, IN, MO, MN, NY, NEW BRUNS., OH

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (146) SPEC. COND. 290; COD 0; Ca HARDNESS as $CaCO_3$ 32.0; TOT. HARDNESS as $CaCO_3$ 146; SO_4 <10; Cl 3.9; F 0.32; Fe <0.1; Na 0.9; K 3.1; Mn <1.0; Si 9.9

Hydropsychidae *Cheumatopsyche arizonensis* (Ling)

	SOURCE / PARAMETERS		280	129	NOTES OR RANGES
	LARVAE				
	ADULT		X	X	
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM		X	X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY		X		3
	CURRENT				
TEMP.	EUTHERMAL	>30C			12
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0	X		7.8
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L	X		9
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL	X		181
	NITRATES		X		<0.05
	NITRITES				0.011
	AMMONIA		X		0.011
	PHOSPHORUS	ORTHO	X		
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A	X		FEBRUARY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII		X	X	
	REGION VIII			X	
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: AZ, CA, NM, NV, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (280) Salinity 0.5 PPT; SPEC. COND. 875; TOT. HARDNESS as $CaCO_3$ 254; TOT. COLIFORMS 23/100 ML; FECAL COLIFORMS 23/100 ML; HCO_3 221; B 80 uG/L; Ca 70; CO_3 <1; Cl 100;OH <0.1; Mg 19; Na 95; SO_4 120; TOT. DISS. SOLIDS 522 @ 180 °C

Hydropsychidae *Cheumatopsyche campyla* Ross

	SOURCE	210	36	146	186	190	235	183	261	245	217	275	111	130	129	206							NOTES OR RANGES
	PARAMETERS																						
	LARVA			X	X	X	X					X	X			X							
	ADULT	X	X					X	X	X	X		X		X	X							
GENERAL HABITAT	LAKE/POND																						
	RIVER	X				X	X		X	X			X	X		X							
	STREAM	X								X													
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
MODE	RETREAT BUILDER											X	X			X							
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE															X							
	DETRITIVORE																						
	TURBIDITY						X							X									0.3 - 180
	CURRENT												X	X									0.4 - 3.0 FT/S
TEMP.	EUTHERMAL >30C															X							2.6 - 32
	MESOTHERMAL 15-30C						X							X		X							
	OLIGOTHERMAL <15C						X							X		X							
	STENOTHERMAL <5C						X							X									
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0						X							X									6.0
	ALKALIPHILOUS >=7.0			X			X							X		X							8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L			X										X									4.6 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL													X		X							10 - 90
	NITRATES			X			X							X									0.05 - 0.5
	NITRITES													X									0.00 - 0.01
	AMMONIA			X										X									0.1 - 3.8
	PHOSPHORUS ORTHO			X			X																0.02 - 0.1
	TOTAL			X			X							X									0.02 - 0.86
	SEASONAL L					X							X										AUGUST
	DISTRIBUTION A	X	X						X				X		X	X							FEB. - DEC.
GEOGRAPHIC DISTRIBUTION	REGION I		X																				
	REGION II	X						X							X								
	REGION III	X																					
	REGION IV	X												X	X								
	REGION V	X			X								X		X								
	REGION VI	X								X		X			X	X							
	REGION VII	X		X					X				X		X								
	REGION VIII	X				X																	
	REGION IX																						
	REGION X	X					X								X								

STATES AND PROVINCES MENTIONED: AR, AL, BRIT. COL., GA, ID, IL, IN, IA, KS, MI, MN, MS, MT, MO, NM, NY, NH, NE, OH, OK, OR, ONT., MANITOBA, PA, SASK., TX, UT, VA, WI, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (146, 235, 130, 206) SPEC. COND. 11.1 - 3300; BOD 5 - 8; COD 19 - 35; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; HCO_3 30 - 78; F 0 - 0.6; Cl 1- 14; 0 - 0.83; Mn 0.19 - 0.66; Cd 0.002 - 0.025; Pb 0.025 - 0.085; Zn 0.02 - 0.06; Ni 0.11 - 0.19; Cu 0.015 - 0.02; Cr 0.006 - 0.008; Si 9.1 - 47.6; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; SO_4 3.0 - 12; B 0 - 0.06

(186) EXPERIMENTALLY CONTROLLED EMERGENCE STUDY FOUND EMERGENCE DATE MOVED UP FROM NORMAL JUNE-JULY TO JANUARY-FEBRUARY WHEN OVERWINTERED IN WATER WITH TEMPERATURE ELEVATED TO 16 C FROM NORMAL TEMPERATURE IN MINNESOTA OF 2 C

(190, 235, 130) 360 - 4100 FT ELEVATION

(206) TOT. DISS. SOLIDS 2420; TOT. HARDNESS as $CaCO_3$ 474; TOT. CA HARDNESS 360; Cl 517

(275) SLOWER CURRENT THAN *Hydropsyche orris*

Hydropsychidae *Cheumatopsyche ela* Denning

	SOURCE		254	130	129	NOTES OR RANGES
	PARAMETERS					
	LARVAE					
	ADULT				X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X	X		
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY			X		4 - 51
	CURRENT			X		36.6 - 68 CM/S
TEMP.	EUTHERMAL	>30C				3.6 - 24
	MESOTHERMAL	15-30C		X		
	OLIGOTHERMAL	<15C		X		
	STENOTHERMAL	<5C		X		
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0		X		6.4
	ALKALIPHILOUS	>=7.0		X		7.0
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L		X		5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		10 - 20
	NITRATES			X		0.06 - 0.40
	NITRITES			X		0.00 - 0.01
	AMMONIA			X		0.30 - 0.76
	PHOSPHORUS	ORTHO				
		TOTAL			X	0.02 - 0.20
	SEASONAL	L				
	DISTRIBUTION	A				
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II				X	
	REGION III					
	REGION IV		X	X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: GA, NC, NY, ONT., TN, VA.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 20.0; SO_4 0 - 3; ELEVATION 213 - 229 M

Hydropsychidae *Cheumatopsyche etrona* Ross

	SOURCE PARAMETERS	130	254	129	NOTES OR RANGES
	LARVAE		X		
	ADULT			X	
GENERAL HABITAT	LAKE/POND				
	RIVER	X	X		
	STREAM	X			
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON		X		
	EMBENTHIC IN				
	EPILITHIC ROCK		X		
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER		X		
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY	X			4 - 51
	CURRENT	X	X		12 - 68 CM/S
TEMP.	EUTHERMAL >30C				2.5 - 24.0
	MESOTHERMAL 15-30C	X			
	OLIGOTHERMAL <15C	X			
	STENOTHERMAL <5C	X			
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0	X			6.4
	ALKALIPHILOUS >=7.0	X			7.0
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L	X			5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL	X			5 - 35
	NITRATES	X			0.04 - 0.57
	NITRITES	X			0.00 - 0.01
	AMMONIA	X			0.30 - 0.76
	PHOSPHORUS ORTHO				
	TOTAL	X			0.02 - 0.20
	SEASONAL L		X		APRIL - JULY
	DISTRIBUTION A			X	APRIL - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV	X	X	X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: GA, NC, SC, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 20.0; SO_4 0 - 3; ELEVATION GREATER THAN 200 M

(254) FOUND ON TOP, BOTTOM, AND LOWER SIDES OF ROCKS

Hydropsychidae *Cheumatopsyche geora* Denning

	SOURCE	130	129	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		0 - 51
	CURRENT	X		36.6 - 45.1
TEMP.	EUTHERMAL >30C			3.8 - 23.8
	MESOTHERMAL 15-30C	X		
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C	X		
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0	X		6.8
	ALKALIPHILOUS >=7.0	X		7.1
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L	X		8.1 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		10 - 20
	NITRATES	X		0.06 - 0.39
	NITRITES	X		0.00 - 0.01
	AMMONIA	X		0.30 - 0.76
	PHOSPHORUS ORTHO			
	TOTAL	X		0.03 - 0.20
	SEASONAL L			
	DISTRIBUTION A		X	APRIL - SEPTEMBE
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV	X	X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: GA, SC, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 23.0; SO_4 0 - 40; ELEVATION 229 - 244 M

Hydropsychidae *Cheumatopsyche gracilis* (Banks)

	SOURCE	195	245	217	129	NOTES OR RANGES
	PARAMETERS					
	LARVAE	X				
	ADULT	X	X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM	X	X			
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C					
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0	X				7.5
	ALKALIBIONTIC >8.5	X				8.8
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL	X				60
	NITRATES	X				1.2 - 2.1
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO	X				0 - 0.1
	TOTAL					
	SEASONAL L	X				JAN. - DEC.
	DISTRIBUTION A	X	X	X	X	JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I				X	
	REGION II				X	
	REGION III				X	
	REGION IV				X	
	REGION V				X	
	REGION VI		X		X	
	REGION VII					
	REGION VIII	X			X	
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: AR, BRIT. COL., CT, MI, ME, MN, MT, MANIT., NY, NC, NOVA SCOTIA, OK, VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (195) CHLORPHYLL a 2.4×10^{-3}; COLIFORMS 70 - 150/100 ML; TOT. HARDNESS as $CaCO_3$ 41 - 43

(217) NORTHERN TRANSCONTINENTAL

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Hydropsychidae *Cheumatopsyche halima* Denning

	SOURCE		167	129	NOTES OR RANGES
	PARAMETERS				
	LARVAE				
	ADULT		X	X	
GENERAL HABITAT	LAKE/POND				
	RIVER		X		
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			0 - 24.5
	MESOTHERMAL	15-30C	X		
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C	X		
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0	X		7.0 - 8.0
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.	X		87 - 130
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL	X		30 - 140
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A		X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I			X	
	REGION II				
	REGION III			X	
	REGION IV		X		
	REGION V			X	
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: AR, ME, MA, OH, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 10.0; TOT. HARDNESS as $CaCO_3$ 110 - 250; Cl 30 - 120; TOT. COLIFORMS 2 - 383/100 ML; STREAM WIDTH 4 - 13 M

Hydropsychidae *Cheumatopsyche lasia* Ross

	SOURCE		210	190	259	275	129	206	NOTES OR RANGES
	PARAMETERS								
	LARVAE			X		X		X	
	ADULT		X		X		X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER		X	X	X			X	
	STREAM		X						
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC	ON							
	EMBENTHIC	IN							
	EPILITHIC	ROCK							
	EPIPHYTIC	PLANT							
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT								
TEMP.	EUTHERMAL	>30C						X	8 - 32
	MESOTHERMAL	15-30C						X	
	OLIGOTHERMAL	<15C						X	
	STENOTHERMAL	<5C							
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0							
	ALKALIPHILOUS	>=7.0						X	7.9 - 8.5
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.							
		MG/L						X	SEE COMMENTS
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL						X	90
	NITRATES								
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO							
		TOTAL							
	SEASONAL	L		X					JUNE - AUGUST
	DISTRIBUTION	A	X		X		X	X	MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V		X				X		
	REGION VI		X		X	X	X	X	
	REGION VII		X				X		
	REGION VIII		X	X					
	REGION IX						X		
	REGION X								

STATES AND PROVINCES MENTIONED: AZ, IL, KS, MO, MN, NE, NM, OK, TX, MT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (206) TOT. DISS. SOLIDS 2420; TOT. HARDNESS as $CaCO_3$ 474; Ca HARDNESS as $CaCO_3$ 360; SPEC. COND. 3300; Cl 517; D.O. NEVER GREATER THAN + OR - 2 MG/L FROM SATURATION

(190) ELEVATION 1998 FT

Hydropsychidae *Cheumatopsyche miniscula* (Banks)

	SOURCE PARAMETERS	210	36	130	234	254	245	129	NOTES OR RANGES
	LARVAE				X	X			
	ADULT	X	X				X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER			X	X	X	X		
	STREAM			X			X		
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY			X					0 - 51
	CURRENT			X					36.6 - 68.0 CM/S
TEMP.	EUTHERMAL >30C								3.6 - 24
	MESOTHERMAL 15-30C			X					
	OLIGOTHERMAL <15C			X					
	STENOTHERMAL <5C			X					
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0			X					6.4
	ALKALIPHILOUS >=7.0			X					7.0
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L			X					5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL			X					5 - 35
	NITRATES			X					0.00 - 0.64
	NITRITES			X					0.00 - 0.01
	AMMONIA			X					0.30 - 0.76
	PHOSPHORUS ORTHO								
	TOTAL			X					0.02 - 0.20
	SEASONAL L								
	DISTRIBUTION A		X				X		MARCH - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I		X					X	
	REGION II	X							
	REGION III							X	
	REGION IV	X		X		X		X	
	REGION V	X						X	
	REGION VI	X					X	X	
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, D.C., GA, KY, ME, MD, MN, MO, NY, OK, ONT., QUE., MANIT., SC, TN, VA, WI, NH

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 23.0; SO_4 0 - 4; ELEVATION GREATER THAN 200 M

(234) FOUND BOTH ABOVE AND BELOW STUDY RESERVOIR

Hydropsychidae *Cheumatopsyche mickeli* Denning

	SOURCE		82	235	129	NOTES OR RANGES
	PARAMETERS					
	LARVAE			X		
	ADULT				X	
GENERAL HABITAT	LAKE/POND					
	RIVER			X		
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY			X		0.3 - 180NTU
	CURRENT					
TEMP.	EUTHERMAL	>30C				2.6 - 26
	MESOTHERMAL	15-30C		X		
	OLIGOTHERMAL	<15C		X		
	STENOTHERMAL	<5C		X		
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0		X		6.0
	ALKALIPHILOUS	>=7.0		X		8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES			X		<0.05 - 0.5
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO		X		<0.02 - 0.05
		TOTAL		X		0.02 - 0.86
	SEASONAL	L				
	DISTRIBUTION	A			X	APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII				X	
	REGION IX		X		X	
	REGION X			X		

STATES AND PROVINCES MENTIONED: CA, OR, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22;TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06

Hydropsychidae *Cheumatopsyche mollala* Ross

	SOURCE		235	245	129	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X			
	ADULT			X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			0.3 - 180 NTU
	CURRENT					
TEMP.	EUTHERMAL	>30C				2.6 - 26
	MESOTHERMAL	15-30C	X			
	OLIGOTHERMAL	<15C	X			
	STENOTHERMAL	<5C	X			
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0	X			6.0
	ALKALIPHILOUS	>=7.0	X			8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES		X			<0.05 - 0.5
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO	X			<0.02 - 0.05
		TOTAL	X			0.02 - 0.86
	SEASONAL	L				
	DISTRIBUTION	A		X	X	JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI			X		
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X		X		X	

STATES AND PROVINCES MENTIONED: AR, ID, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06

Hydropsychidae *Cheumatopsyche oxa* Ross

	SOURCE	62	36	66	167	277	[illegible]	[illegible]	NOTES OR RANGES
	PARAMETERS								
	LARVAE			X		X			
	ADULT	X	X		X	X	X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER				X				
	STREAM	X		X		X	X		
	SPRING	X							
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	ENBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE					X			
	TURBIDITY			X					[illegible]
	CURRENT					X			SEE COMMENTS
TEMP.	EUTHERMAL >30C								X = 24.5
	MESOTHERMAL 15-30C			X	X				
	OLIGOTHERMAL <15C				X				
	STENOTHERMAL <5C				X				
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0				X				7.0 - 8.2
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.				X				80 - 131
	MG/L								
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL				X				80 - 183
	NITRATES								
	NITRITES								
	AMMONIA			X					TRACE
	PHOSPHORUS ORTHO			X					0.003 - 0.33
	TOTAL								
	SEASONAL DISTRIBUTION L								
	A	X	X				X	X	
GEOGRAPHIC DISTRIBUTION	REGION I		X						
	REGION II	X							
	REGION III	X							
	REGION IV	X							
	REGION V	X			X			X	
	REGION VI	X					X	X	
	REGION VII							X	
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, GA, IN, IL, KY, MD, NY, NC, MN, ONT., OH, SC, TN, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 167) BOD 2.6; FREE CO_2 0.0 - 3.3; TOT. HARDNESS as $CaCO_3$ 115 - 240; TOT. COLIFORMS 3 - 323/100 ML; SUSP. SOLIDS 19; DISS. SOLIDS 274; TOT. KJ. N 0.26; Cl 30 - 75; MEAN STREAM WIDTH 4 - 10 M

(277) STATISTICALLY SHOWED PREFERENCE FOR STREAMS WITH: SUBSTRATE STONES <3 CM DIA.; HIGH MOSS VOLUME; CURRENT 20 - 40 CM/S; DEPTH <10 CM

Hydropsychidae *Cheumatopsyche parselia* Ross

	SOURCE / PARAMETERS	210	36	113	130	129	NOTES OR RANGES
	LARVAE			X			
	ADULT	X	X			X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X		X	X		
	STREAM	X			X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY			X			1.6 - 7.3
	CURRENT						
TEMP.	EUTHERMAL >30C						0 - 22
	MESOTHERMAL 15-30C			X			
	OLIGOTHERMAL <15C			X			
	STENOTHERMAL <5C			X			
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0			X			6.6
	ALKALIPHILOUS >=7.0			X			7.3
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.			X			98 - 110
	MG/L			X	X		4.8 - 14.6
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL			X	X		5 - 80
	NITRATES			X	X		0.01 - 2.79
	NITRITES			X	X		0.00 - 0.35
	AMMONIA			X			0 - 0.4
	PHOSPHORUS ORTHO						
	TOTAL			X			0.03 - 0.22
	SEASONAL DISTRIBUTION L			X			FEB. - DEC.
	A		X			X	APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X		X	
	REGION II						
	REGION III	X				X	
	REGION IV	X			X	X	
	REGION V	X				X	
	REGION VI					X	
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: FL, GA, IL, IN, KY, ME, MD, MS, MA, NC, NH, PA, SC, TN, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (113) SPEC. COND. 35 - 65; TOT. HARDNESS as $CaCO_3$ 13 - 25; Fe 0.08 - 0.32; SO_4 6 - 10; Cl 3.6 - 5.6

(130) ELEVATION 200 - 600 M

Hydropsychidae *Cheumatopsyche pettiti* (Banks)

	SOURCE / PARAMETERS		62	167	275	129	135	NOTES OR RANGES
	LARVAE		X		X			
	ADULT			X		X	X	
GENERAL HABITAT	LAKE/POND							
	RIVER			X				
	STREAM		X				X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON						
	EMBENTHIC	IN						
	EPILITHIC	ROCK						
	EPIPHYTIC	PLANT						
	OTHER							
HOME	RETREAT BUILDER				X			
	CASE MAKER							
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY		X			X		0.5 - 1.8
	CURRENT							
TEMP.	EUTHERMAL	>30C						0 - 26
	MESOTHERMAL	15-30C		X			X	
	OLIGOTHERMAL	<15C		X			X	
	STENOTHERMAL	<5C		X			X	
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0					X	5.9
	ALKALIPHILOUS	>=7.0		X				8.2
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.		X			X	66 - 130
		MG/L					X	6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL		X			X	3.7 - 123
	NITRATES						X	SEE COMMENTS
	NITRITES						X	SEE COMMENTS
	AMMONIA		X					TRACE
	PHOSPHORUS	ORTHO	X				X	0.01 - 0.55
		TOTAL						
SEASONAL DISTRIBUTION		L						
		A				X		APRIL - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I					X		
	REGION II					X		
	REGION III					X		
	REGION IV					X		
	REGION V			X	X	X		
	REGION VI					X		
	REGION VII					X		
	REGION VIII					X		
	REGION IX							
	REGION X					X		

STATES AND PROVINCES MENTIONED: AR, CO, CT, DE, FL, GA, ID, IL, IN, MD, MA, MI, MN, MO, NJ, NY, NC, OH, OK, OR, ONT., PA, SC, SD, SASK., QUE., TX, VA, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 167, 135) BOD 2.6; SUSP. SOLIDS 28; DISS. SOLIDS 274; SPEC. COND. 17 - 40; TOT. KJ. N 0.26; FREE CO_2 0.0 - 9.0; TOT. HARDNESS 9.0 - 250; TOT. ORG. C 4 - 20; TOT. COLIFORMS 1 - 323/100 ML; Cl 30 - 135

(167) MEAN STREAM WIDTH 2 - 10 METERS

(135) COLLECTED IN LAKE WITH NO SUMMER DEFICIT IN O_2

(135) $NO_2 + NO_3$ 0 - 0.1

Hydropsychidae *Cheumatopsyche pinaca* Ross

	SOURCE PARAMETERS	130	129	NOTES OR RANGES
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER	X		
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		0 - 51
	CURRENT	X		36.6 - 45.1 CM/S
TEMP.	EUTHERMAL >30C			1.7 - 26.5
	MESOTHERMAL 15-30C	X		
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C	X		
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0	X		6.8
	ALKALIPHILOUS >=7.0	X		7.1
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		5 - 80
	NITRATES	X		0.00 - 1.91
	NITRITES	X		0.00 - 0.03
	AMMONIA	X		0.3 - 0.76
	PHOSPHORUS ORTHO			
	TOTAL	X		0.03 - 0.20
	SEASONAL L			
	DISTRIBUTION A		X	APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I		X	
	REGION II		X	
	REGION III			
	REGION IV	X	X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: FL, GA, MA, NC, NJ, RI, SC, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SO_4 0 - 4; ELEVATION 200 - 600 M

Hydropsychidae *Cheumatopsyche sordida* (Hagen)

	SOURCE PARAMETERS	210	245	130	129	NOTES OR RANGES
	LARVAE					
	ADULT	X	X		X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X	X		
	STREAM		X			
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY	X				8 - 30
	CURRENT	X				41 - 68 CM/S
TEMP.	EUTHERMAL >30C					3.6 - 24
	MESOTHERMAL 15-30C	X				
	OLIGOTHERMAL <15C	X				
	STENOTHERMAL <5C	X				
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0	X				6.4 - 6.9
	ALKALIPHILOUS >=7.0					
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L	X				5.5 - 10.4
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL	X				10 - 20
	NITRATES	X				0.26 - 0.40
	NITRITES	X				TRACE
	AMMONIA	X				0.30 - 0.40
	PHOSPHORUS ORTHO					
	TOTAL	X				0.02 - 0.12
	SEASONAL L					
	DISTRIBUTION A	X	X			APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I				X	
	REGION II	X			X	
	REGION III	X			X	
	REGION IV	X		X	X	
	REGION V	X				
	REGION VI	X	X		X	
	REGION VII	X				
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: AR, GA, IL, IN, KY, MI, ME, MD, MN, NJ, NY, PA, QUE., SC, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.5 - 10; SO_4 0; ELEVATION 213 M

Hydropsychidae *Diplectrona modesta* Banks

	SOURCE	210	36	84	130	239	283	167	245	60	240	165	135	NOTES OR RANGES
	PARAMETERS													
	LARVAE	X				X	X			X	X	X		
	ADULT	X	X	X		X		X	X			X	X	
GENERAL HABITAT	LAKE/POND													
	RIVER				X									
	STREAM	X			X	X	X		X	X	X	X	X	
	SPRING	X												
	TEMP. WATERS													
SPECIFIC HABITAT	EPIBENTHIC ON													
	EMBENTHIC IN													
	EPILITHIC ROCK													
	EPIPHYTIC PLANT													
	OTHER													
HOME	RETREAT BUILDER													
	CASE MAKER													
	FREELIVING													
DIET	CARNIVORE													
	HERBIVORE													
	OMNIVORE									X				
	DETRITIVORE													
	TURBIDITY				X		X						X	0 - 51
	CURRENT				X									36.6 - 68 CM/S
TEMP.	EUTHERMAL >30C				X		X			X		X	X	0 - 26
	MESOTHERMAL 15-30C				X		X			X		X	X	
	OLIGOTHERMAL <15C				X		X					X	X	
	STENOTHERMAL <5C													
PH	ACIDOBIONTIC <5.5											X		4.6
	ACIDOPHILIC <7.0				X		X				X	X	X	
	ALKALIPHILOUS >=7.0				X					X				7.6
	ALKALIBIONTIC >8.5													
DO	DISS. OXYGEN % SAT.												X	66 - 95
	MG/L				X		X						X	4.4 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.										X			0.0
	TOTAL				X		X			X	X		X	3.7 - 170
	NITRATES				X								X	0.00 - 2.13
	NITRITES				X								X	0.00 - 0.11
	AMMONIA				X					X				0.3 - 0.76
	PHOSPHORUS ORTHO												X	0.01 - 0.15
	TOTAL				X		X			X				4.05 - 200 uG/L
	SEASONAL L					X					X			JAN. - DEC.
	DISTRIBUTION A	X	X			X								APRIL - JULY
GEOGRAPHIC DISTRIBUTION	REGION I	X	X									X		
	REGION II	X												
	REGION III	X												
	REGION IV	X			X	X	X			X	X			
	REGION V	X						X						
	REGION VI	X							X					
	REGION VII													
	REGION VIII													
	REGION IX													
	REGION X													

STATES AND PROVINCES MENTIONED:AR, FL, GA, IL, IN, NH, NY, NC, OK, OH, ONT., PA, QUE., SC, TN, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(130, 283, 60, 240, 135) SPEC. COND. 8.7 - 40; DISS. ORG. C 0.1 - 2.4; CO_2 3.5; TOT. ORG. C 4 - 20; TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; SO_4 0 - 3; Ca 0.47 - 24.5; Mg 0.213 - 13.3; Na 0.6 - 1.125; K 0.431 - 0.7

(130) ELEVATION 600 - 1067 METERS

(240) ELEVATION 4000 FT

Hydropsychidae *Hydropsyche aerata* Ross

	SOURCE	210	98	259	228	NOTES OR RANGES
	PARAMETERS					
	LARVAE	X	X		X	
	ADULT	X		X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER	X	X	X	X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			<5 - 10
	CURRENT					
TEMP.	EUTHERMAL >30C					5 - 12
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C		X			
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0		X			7.8 - 8.2
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.		X			61 - 94
	MG/L		X			6.6 - 12.0
H_2O CHEMISTRY	ALKALINITY PHTH.		X			0
	TOTAL		X			135 - 189
	NITRATES		X			1.3 - 3.2
	NITRITES		X			0.005 - 0.110
	AMMONIA		X			0.30 - 0.90
	PHOSPHORUS ORTHO		X			0.04 - 6.0
	TOTAL					
	SEASONAL L		X		X	SEPTEMBER - DEC.
	DISTRIBUTION A	X		X	X	MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V	X		X	X	
	REGION VI					
	REGION VII		X			
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: IL, IN, MI, MO

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (98) Mg HARDNESS as $CaCO_3$ 7 - 13; Ca HARDNESS as $CaCO_3$ 129 - 175; SPEC. COND. 270 - 450; DETERGENTS as ABS 0.0 - 0.2; COLIFORMS 20 - 600/100 ML; FECAL STREPTOCOCCI 8 - 400/100 ML; COLOR 1 - 10 UNITS; Fe 0.02; Mn 0.00 - 0.01; SO_4 12 - 13; Si 7.4 - 8.6; Na 5.0 - 17; K 1.2 - 3.1; Cl 4.7 - 19; F 0.1 - 0.2

(228) FOUND WHERE WATER WAS BROWNISH IN COLOR AND HIGH IN SUSPENDED LOAD OF ORGANICS

Hydropsychidae *Hydropsyche alvata* Denning

	SOURCE	245	130	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT	X		
GENERAL HABITAT	LAKE/POND			
	RIVER	X	X	
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	8 - 30
	CURRENT		X	41 - 68 CM/S
TEMP.	EUTHERMAL >30C			3.6 - 24
	MESOTHERMAL 15-30C		X	
	OLIGOTHERMAL <15C		X	
	STENOTHERMAL <5C		X	
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0		X	6.4 - 6.9
	ALKALIPHILOUS >=7.0			
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L		X	5.5 - 10.4
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL		X	10 - 20
	NITRATES		X	0.26 - 0.40
	NITRITES		X	TRACE
	AMMONIA		X	0.30 - 0.40
	PHOSPHORUS ORTHO			
	TOTAL		X	0.02 - 0.12
	SEASONAL L			
	DISTRIBUTION A	X		MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV		X	
	REGION V			
	REGION VI	X		
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: AR, GA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.5 - 20; SO_4 0; ELEVATION 213 M

Hydropsychidae *Hydropsyche arinale* Ross

	SOURCE	210	98	148	189	245	228	NOTES OR RANGES
	PARAMETERS							
	LARVAE	X	X	X	X		X	
	ADULT	X				X		
GENERAL HABITAT	LAKE/POND							
	RIVER		X	X		X		
	STREAM	X			X	X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN							
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY		X	X				6 - 13
	CURRENT							
TEMP.	EUTHERMAL >30C							11 - 20
	MESOTHERMAL 15-30C		X	X				
	OLIGOTHERMAL <15C		X	X				
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0		X	X				7.6 - 8.2
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.		X					62 - 109
	MG/L		X	X				6.6 - 10.4
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL		X	X	X			121 - 178
	NITRATES		X	X				<0.1 - 3.4
	NITRITES		X					0.000 - 0.005
	AMMONIA		X					0.55 - 0.70
	PHOSPHORUS ORTHO		X	X				0.04
	TOTAL							
	SEASONAL L		X	X				AUGUST - NOV.
	DISTRIBUTION A	X				X	X	MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III				X			
	REGION IV				X			
	REGION V	X		X			X	
	REGION VI	X				X	X	
	REGION VII	X	X				X	
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: AR, IL, KY, KS, MO, MI, OK, WI, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (98, 148, 189) TOT. HARDNESS as $CaCO_3$ 159 - 213; Mg HARDNESS as $CaCO_3$ 13 - 45; Ca HARDNESS as $CaCO_3$ 115 - 120; PHTH. ACIDITY as $CaCO_3$ 0; SPEC. COND. 240 - 280; DETERGENTS as ABS 0.0; COLIFORMS 100 - 110/100 ML; FECAL STREPTOCOCCI 40 - 370/100 ML; Cl 15

(228) SHOWED PREFERENCE FOR RELATIVELY CLEAR STREAMS WITH MANY RIFFLES OR RAPIDS

Hydropsychidae *Hydropsyche betteni* Ross

	SOURCE / PARAMETERS	210	3	13	26	27	98	121	132	130	148	187	186	234	256	62	25	167	259	227	141	135	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		
	ADULT																		X			X	
GENERAL HABITAT	LAKE/POND																						
	RIVER		X	X			X	X	X		X	X		X			X	X		X	X		
	STREAM									X						X	X			X		X	
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON									X							X				X		
	EMBENTHIC IN																						
	EPILITHIC ROCK									X							X				X		
	EPIPHYTIC PLANT																X						
	OTHER																				X		SAND
HOME	RETREAT BUILDER																X						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY		X				X				X					X						X	0.5 - 60
	CURRENT																				X		0.05 - 2.51 FT/S
TEMP.	EUTHERMAL >30C																						0 - 29.4
	MESOTHERMAL 15-30C		X	X			X		X	X	X							X					
	OLIGOTHERMAL <15C						X			X	X							X					
	STENOTHERMAL <5C						X			X								X					
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																					X	5.9
	ALKALIPHILOUS >=7.0			X			X		X		X							X					8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.			X			X											X				X	66 - 132
	MG/L		X	X			X	X	X	X	X											X	1.0 - 15.5
H_2O CHEMISTRY	ALKALINITY PHTH.			X			X																0 - 8
	TOTAL		X	X			X			X	X							X				X	3.7 - 198
	NITRATES		X	X			X		X	X												X	0.2 - 8.0
	NITRITES		X	X			X		X	X												X	0.000 - 0.11
	AMMONIA		X	X			X		X														0.01 - 8.0
	PHOSPHORUS ORTHO		X	X			X		X		X					X						X	0.0 - 2.6
	TOTAL		X																				0.1
	SEASONAL DISTRIBUTION L		X	X			X		X		X						X			X			MARCH - DECEMBER
	A	X																	X				APRIL - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II	X																					
	REGION III																						
	REGION IV	X								X										X			
	REGION V	X						X	X		X	X	X					X	X		X		
	REGION VI																						
	REGION VII						X																
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED:AR, GA, IA, IL, IN, FL, MI, MO, MN, KY, MA, NH, NE, NY, NC, OH, ONT., QUE., TN, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(3, 13, 98, 132, 148, 62, 167, 135) Mg HARDNESS as $CaCO_3$ 6 - 32; Ca HARDNESS as $CaCO_3$ 124 - 245; SPEC. COND. 17 - 570; COLOR 1 - 10 UNITS; DETERGENTS as ABS 0.0 - 0.2; COLIFORMS <2 - 2300/100 ML; FECAL STREPTOCOCCI 4 - 90/100 ML; TOT. SOLIDS 165 - 290; DISS. SOLIDS 274; SUSP. SOLIDS 28; TOT. HARDNESS as $CaCO_3$ 9.0 - 260; ORG. N 0.204 - 6.43; CYANIDE <0.005; PHENOLS <0.001; TOT. ORG. C 4 - 20; TOT. KJ. N 0.26; BOD 2.6; FREE CO_2 0.0 - 10.0; Fe 0.01 - 0.8 ; Mn 0.00 - 0.13; SO_4 4.0 - 258; Si 3.7 - 9.9; Na 1.5 - 17; K 0.8 - 3.1; Cl<0.01 - 120; F 0 - 0.2; COD 15; Cd 0.00008; Cu 0.004; Pb 0.003; Hg 0.0002

(26) pH AT WHICH 50% OF TEST ORGANISMS DIED AFTER 96 HOUR EXPOSURE = 3.15

(27) pH FOR 50% SUCESSFUL EMERGENCE = 4.7

(257) 96 HOUR TL_m OF MERCURY = 2.0 MG/L

(187) LC_{50} OF OXYGEN LEVELS AT 21 C FOR 96 HR. = 2.9 MG/L; AT 10 C FOR 96 HR. = 1.0 MG/L

(228) ONE OF MOST RESISTANT *Hydropsyche* TO ORGANIC POLLUTION

(234) FOUND BOTH ABOVE AND BELOW STUDY RESERVOIR

Hydropsychidae *Hydropsyche bidens* Ross

	SOURCE / PARAMETERS	210	245	228	130	NOTES OR RANGES
	LARVAE			X		
	ADULT	X	X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER	X	X	X	X	
	STREAM	X	X			
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER			X		
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	4 - 51
	CURRENT				X	36.6 CM/S
TEMP.	EUTHERMAL >30C					4 - 23
	MESOTHERMAL 15-30C				X	
	OLIGOTHERMAL <15C				X	
	STENOTHERMAL <5C				X	
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0				X	6.8
	ALKALIPHILOUS >=7.0				X	7.0
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L				X	8.3 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL				X	10 - 20
	NITRATES				X	0.06 - 0.34
	NITRITES				X	0.00 - 0.01
	AMMONIA				X	0.30 - 0.76
	PHOSPHORUS ORTHO					
	TOTAL				X	0.03 - 0.20
	SEASONAL L					
	DISTRIBUTION A	X	X			APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV				X	
	REGION V	X		X		
	REGION VI		X	X		
	REGION VII	X		X		
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: AR, GA, IL, IN, IA, MI, MN, MO, OH, TX, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 19.1; SO_4 0 - 3; ELEVATION 229 M

(228) LARGE RIVERS; ABLE TO COPE WITH HEAVY SILTATION

Hydropsychidae *Hydropsyche californica* Banks

	SOURCE PARAMETERS	235	217	236	NOTES OR RANGES
	LARVAE	X		X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER	X		X	
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON			X	
	EMBENTHIC IN				
	EPILITHIC ROCK			X	
	EPIPHYTIC PLANT				
	OTHER			X	MUD
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY	X		X	SEE COMMENTS
	CURRENT			X	0 - 2.9 FT/S
TEMP.	EUTHERMAL >30C				0 - 26
	MESOTHERMAL 15-30C	X		X	
	OLIGOTHERMAL <15C	X		X	
	STENOTHERMAL <5C	X		X	
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0	X			6.0
	ALKALIPHILOUS >=7.0	X			8.2
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL			X	0 - 269
	NITRATES	X			<0.05 - 0.5
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO	X		X	0 - 3.0
	TOTAL	X			0.02 - 0.86
	SEASONAL L				
	DISTRIBUTION A		X		AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V		X		
	REGION VI				
	REGION VII				
	REGION VIII			X	
	REGION IX				
	REGION X	X			

STATES AND PROVINCES MENTIONED: BRIT. COL., MN, OR, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(235, 236) SPEC. COND. 0 - 399; Ca HARDNESS as $CaCO_3$ 10 - 319; Mg HARDNESS as $CaCO_3$ 0 - 119; Ca-Mg HARDNESS as $CaCO_3$ 21 - 74; NON-CARBONATE HARDNESS 0 - 10; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Cl 1 - 14; SO_4 0 - 49; Si 1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; B 0 - 0.06; ELEVATION 360 - 6985 FT

(217) WIDESPREAD THROUGHOUT WESTERN MONTANE REGION

(235) TURBIDITY 0.3 - 180 NTU

(236) TURBIDITY 0 - 99 JTU

Hydropsychidae *Hydropsyche cuanis* Ross

	SOURCE		210	3	98	228	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X	X	X	X	
	ADULT		X				
GENERAL HABITAT	LAKE/POND						
	RIVER		X	X	X	X	
	STREAM						
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY				X		16 - 70
	CURRENT						
TEMP.	EUTHERMAL	>30C					4.5 - 23
	MESOTHERMAL	15-30C			X		
	OLIGOTHERMAL	<15C		X	X		
	STENOTHERMAL	<5C			X		
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0		X	X		7.2 - 8.4
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.		X	X		73 - 146
		MG/L		X	X		7.5 - 12.8
H_2O CHEMISTRY	ALKALINITY	PHTH.			X		0
		TOTAL		X	X		80 - 172
	NITRATES			X	X		0.12 - 12.0
	NITRITES			X	X		0.0030 - 0.150
	AMMONIA			X	X		0.01 - 16
	PHOSPHORUS	ORTHO		X	X		0.00 - 8.4
		TOTAL		X			0.075 - 0.18
	SEASONAL	L		X	X	X	MAY - AUGUST
	DISTRIBUTION	A	X			X	MAY - DECEMBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV					X	
	REGION V		X			X	
	REGION VI						
	REGION VII			X	X		
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, IN, MI, MO, NE, TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (3, 98) Ca HARDNESS as $CaCO_3$ 94 - 247; Mg HARDNESS as $CaCO_3$ 7 - 24; SPEC. COND. 200 - 727; DETERGENTS as ABS 0.0 - 0.1; COLIFORMS 2 - 130,000/100 ML; FECAL COLIFORMS 2900 - 11,000/100 ML; FECAL STREPTOCOCCI 10 - 320/100 ML; COLOR 1 - 6 UNITS; DISS. SOLIDS 435 - 580; SUSP. SOLIDS 26 - 178; BOD 1.4 - 1.8; COD 11 - 15; CYANIDE $<$0.005; METHYLENE BLUE ACTIVE SUBSTANCES $<$0.025; PHENOLS $<$0.001 - 0.001; Fe 0.00 - 0.95; Mn 0.00 - 0.18; SO_4 7.0 - 199; S $<$0.001; Si 6.5 - 18; Na 2.6 - 64; K 1.1 - 4.8; Cl 3.4 - 14.5; F 0.0 - 6.0; Ca 58 - 60; ORG. N 0.40 - 0.54; ORG. C 6.5 - 7.9; Cd $8 \times 10^{-5} - 1 \times 10^{-4}$; Cu $2 \times 10^{-3} - 4.2 \times 10^{-3}$; Pb $<$0.001 - 0.001; Hg $2.1 \times 10^{-4} - 7.2 \times 10^{-4}$; Zn $9 \times 10^{-3} - 1.4 \times 10^{-2}$

Hydropsychidae *Hydropsyche depravata* Hagen

	SOURCE		210	228																				NOTES OR RANGES
	PARAMETERS																							
	LARVAE			X																				
	ADULT		X																					
GENERAL HABITAT	LAKE/POND																							
	RIVER																							
	STREAM			X																				
	SPRING																							
	TEMP. WATERS																							
SPECIFIC HABITAT	EPIBENTHIC	ON		X																				
	EMBENTHIC	IN																						
	EPILITHIC	ROCK		X																				
	EPIPHYTIC	PLANT																						
	OTHER																							
HOME	RETREAT BUILDER																							
	CASE MAKER																							
	FREELIVING																							
DIET	CARNIVORE																							
	HERBIVORE																							
	OMNIVORE																							
	DETRITIVORE																							
	TURBIDITY																							
	CURRENT																							
TEMP.	EUTHERMAL	>30C																						
	MESOTHERMAL	15-30C																						
	OLIGOTHERMAL	<15C																						
	STENOTHERMAL	<5C																						
PH	ACIDOBIONTIC	<5.5																						
	ACIDOPHILIC	<7.0																						
	ALKALIPHILOUS	>=7.0																						
	ALKALIBIONTIC	>8.5																						
DO	DISS. OXYGEN	% SAT.																						
		MG/L																						
H_2O CHEMISTRY	ALKALINITY	PHTH.																						
		TOTAL																						
	NITRATES																							
	NITRITES																							
	AMMONIA																							
	PHOSPHORUS	ORTHO																						
		TOTAL																						
	SEASONAL	L		X																				APRIL
	DISTRIBUTION	A																						
GEOGRAPHIC DISTRIBUTION	REGION I																							
	REGION II																							
	REGION III																							
	REGION IV		X	X																				
	REGION V		X	X																				
	REGION VI																							
	REGION VII																							
	REGION VIII																							
	REGION IX																							
	REGION X																							

STATES AND PROVINCES MENTIONED:GA, IN, KY, NC, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228) SMALL, WARM-WATER STREAMS WITH HIGH AMOUNT OF ORGANIC MATERIAL, WITH LARVAE IN RIFFLE AREAS ON MEDIUM SIZED ROCKS

Hydropsychidae *Hydropsyche dicantha* Ross

	SOURCE	[illegible]	[illegible]	[illegible]	[illegible]	NOTES ON RANGES
	PARAMETERS					
	LARVAE				X	
	ADULT	X	X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER				X	
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	ENBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C					
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0					
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL					
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL					
	SEASONAL L				X	MAY - JULY
	DISTRIBUTION A		X			JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X		X	
	REGION II	X				
	REGION III	X				
	REGION IV	X			X	
	REGION V	X		X	X	
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: D.C., KY, MI, MN, NS, NY, OH, ONT., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228) HABITAT RANGES FROM SMALL AND LARGE WARM-WATER STREAMS TO MEDIUM SIZED TROUT STREAMS WITH FAIRLY COLD WATER THROUGHOUT THE YEAR

Hydropsychidae *Hydropsyche fattigi* Ross

	SOURCE / PARAMETERS	254	130	NOTES OR RANGES
	LARVAE			
	ADULT			
GENERAL HABITAT	LAKE/POND			
	RIVER	X	X	
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	4 - 51
	CURRENT		X	36.6 - 68 CM/S
TEMP.	EUTHERMAL >30C			3.6 - 24
	MESOTHERMAL 15-30C		X	
	OLIGOTHERMAL <15C		X	
	STENOTHERMAL <5C		X	
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0			
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L		X	5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL		X	10 - 20
	NITRATES		X	0.06 - 0.40
	NITRITES		X	0.00 - 0.01
	AMMONIA		X	0.30 - 0.76
	PHOSPHORUS ORTHO			
	TOTAL		X	0.02 - 0.20
	SEASONAL L			
	DISTRIBUTION A			
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV	X	X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: GA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: [130] SPEC. COND. 11.1 - 20.0; SO_4 0 - 3; ELEVATION 213 - 229 M

Hydropsychidae *Hydropsyche frisoni* Ross

	SOURCE PARAMETERS	210	116	119	4	3	23	13	51	174	198	179	228										NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	X	X	X	X	X	X										
	ADULT	X																					
GENERAL HABITAT	LAKE/POND																						
	RIVER	X			X	X	X	X	X	X		X	X										
	STREAM										X												
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER			X																			
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY				X			X	X	X	X												<25 - 500+
	CURRENT								X														1.25 - 2.48 FT/S
TEMP.	EUTHERMAL >30C					X																	6 - 31.5
	MESOTHERMAL 15-30C			X	X	X		X		X	X	X											
	OLIGOTHERMAL <15C					X					X												
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0										X												6.6
	ALKALIPHILOUS >=7.0				X	X		X		X	X	X											8.4
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.				X	X		X			X												53 - 108
	MG/L				X			X		X	X	X											4.4 - 13.9
H_2O CHEMISTRY	ALKALINITY PHTH.							X															0
	TOTAL				X	X		X	X	X	X												38 - 180
	NITRATES				X	X			X														0.10 - 1.2
	NITRITES				X	X		X	X														0.000 - 0.033
	AMMONIA				X	X		X	X		X	X											<0.01 - 0.7
	PHOSPHORUS ORTHO				X			X			X												0.0 - 0.33
	TOTAL					X			X		X												0.072 - 1.4
	SEASONAL DISTRIBUTION L				X	X	X	X	X	X	X	X	X										JUNE - OCTOBER
	A	X																					APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III												X										
	REGION IV	X		X			X			X			X										
	REGION V										X												
	REGION VI				X	X		X	X			X											
	REGION VII																						
	REGION VIII		X																				
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: CO, IL, IN, IA, KS, MI, MO, NE, TN, TX

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (3, 4, 13, 51, 174, 198, 179) TOT. COLIFORMS 2000 - 130,000/100 ML; FECAL COLIFORMS 4 - 11,000/100 ML; FECAL STREPTOCOCCI 12 - 520/100 ML; TOT. DISS. SOLIDS 144 - 580; TOT. SUSP. SOLIDS 26 - 251; SETTLEABLE SOLIDS <0.1 - 0.3; BOD 0.4 - 2.1; COD 11 - 127; ORG. C 4.2 - 26; ORG. N 0.40 - 0.79; CYANIDE <0.001 - 0.02; PHENOLS <0.001 - 0.007; HEXANE SOL. MATERIAL 1.2 - 2.1; Mn 0.052 - 0.2; TOT. HARDNESS as $CaCO_3$ 128; TOT. KJ. N 0.7; Ca 58 - 68; As 0.0007; SPEC. COND. 290 - 1080; SECCHI DISK [illegible]

(119) MARKED DECREASE IN FOOD UPTAKE FROM [illegible] TO [illegible], PROBABLY INDICATES APPROACH OF LETHAL TEMPERATURE

(23) CLASSIFIED AS FACULTATIVE POLLUTION TOLERANCE

(119) PREFERS MEDIUM TO LARGE RIVERS

Hydropsychidae *Hydropsyche occidentalis* Banks

	SOURCE	82	152	190	195	193	280	235	217	NOTES OR RANGES
	PARAMETERS									
	LARVAE		X	X	X			X		
	ADULT			X		X	X		X	
GENERAL HABITAT	LAKE/POND									
	RIVER			X				X		
	STREAM		X		X		X			
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON									
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT									
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY		X				X	X		3 - 125
	CURRENT									
TEMP.	EUTHERMAL >30C		X							0 - 31.9
	MESOTHERMAL 15-30C		X					X		
	OLIGOTHERMAL <15C		X				X	X		
	STENOTHERMAL <5C		X					X		
PH	ACIDOBIONTIC <5.5									
	ACIDOPHILIC <7.0							X		6.0
	ALKALIPHILOUS >=7.0		X		X		X	X		
	ALKALIBIONTIC >8.5				X					8.8
DO	DISS. OXYGEN % SAT.									
	MG/L						X			9
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL		X		X		X			60 - 278
	NITRATES		X		X		X	X		<0.05 - 2.4
	NITRITES									
	AMMONIA						X			0.011
	PHOSPHORUS ORTHO		X		X		X	X		<0.02 - 0.392
	TOTAL							X		0.02 - 0.86
	SEASONAL L				X		X			JAN. - DEC.
	DISTRIBUTION A			X						AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II									
	REGION III									
	REGION IV									
	REGION V									
	REGION VI									
	REGION VII									
	REGION VIII		X	X	X		X			
	REGION IX	X								
	REGION X	X						X		

STATES AND PROVINCES MENTIONED: BRIT. COL., ID, MT, OR, SASK., UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: [152, 195, 280, 235] SPEC. COND. 32 - 1715; HARDNESS as $CaCO_3$ 41 - 534; Ca-Mg HARDNESS as $CaCO_3$ 21 - 74; NON-CARBONATE HARDNESS 0 - 10; SESTON CHLOROPHYLL a 1.9 - 2.5 X 10^{-3} MG/L; TOT. COLIFORMS 23 - 150/100 ML; FECAL COLIFORMS 23/100 ML; TOT. DISS. SOLIDS 102 @ 180 C; SALINITY 0.5 PPM; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 116; TOT. ORG. C @1.1 - 5.1; [illegible] B 0 - 0.08; Ca 5.6 - 73; CO_3 [illegible]; Cl 1 - 100; Mg 1.4 - 16; [illegible] 7.1; pH IN LAB TEST 8.15; K 0.6 - 12.7; Na 5.0 - 97; HCO_3 34 - 205; SO_4 3.0 - 120; F 0 - 0.6

[152] ELEVATION 1207 - 1517 M

[280] ELEVATION 2840 - 5110 FT

[217] WIDESPREAD THROUGHOUT WESTERN MONTANA AREAS

Hydropsychidae

Hydropsyche orris Ross

	SOURCE	210	4	3	23	51	123	124	130	174	191	197	179	261	259	255	245	228	111				NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X	X	X	X	X	X	X		X	X	X				X		X	X				
	ADULT	X												X			X	X	X				
GENERAL HABITAT	LAKE/POND																						
	RIVER	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X				
	STREAM		X														X						
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON								X		X					X							
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT								X		X					X							
	OTHER																						
HOME	RETREAT BUILDER															X			X				
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY		X			X	X	X		X	X												11 - 750
	CURRENT					X										X			X				0.31 - 3.0 FT/S
TEMP.	EUTHERMAL >30C			X																			7.0 - 31.5
	MESOTHERMAL 15-30C		X	X			X	X	X	X	X	X	X										
	OLIGOTHERMAL <15C			X			X	X	X		X												
	STENOTHERMAL <5C										X												
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0		X				X	X			X	X											6.2
	ALKALIPHILOUS >=7.0		X	X		X	X	X		X	X		X										
	ALKALIBIONTIC >8.5							X		X													8.7
DO	DISS. OXYGEN % SAT.		X	X																			68 - 101
	MG/L		X	X		X	X	X		X				X									4.2 - 14.0
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL			X		X		X	X	X	X												11.2 - 320
	NITRATES			X		X	X	X	X														0 - 1.2
	NITRITES			X		X																	0.003 - 0.1
	AMMONIA			X		X	X	X				X											0 - 0.56
	PHOSPHORUS ORTHO			X				X															0.004 - 0.2
	TOTAL			X		X																	0.072 - 1.4
	SEASONAL L			X	X	X				X	X	X						X	X				MARCH - DECEMBER
	DISTRIBUTION A		X											X					X				APRIL - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV		X				X	X	X							X		X					
	REGION V		X		X					X	X				X			X	X				
	REGION VI		X									X					X	X					
	REGION VII		X	X		X							X	X	X				X				
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AL, AR, GA, IL, IN, IA, KS, KY, MI, MO, MN, LA, NE, OK, TN, TX, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (4, 3, 51, 123, 124, 174, 191, 197, 179) COLOR 15 - 120 UNITS; TOT. DIS. SOLIDS 32 - 907; TOT. SUSP. SOLIDS <0.1 - 178; HARDNESS as $CaCO_3$ 8.5 - 411; TOT. COLIFORMS 2900 - 130,000/100 ML; FECAL COLIFORMS 700 - 1100/100 ML; FECAL STREPTOCOCCI 12 - 320/100 ML; ORG. N 0.4 - 0.59; TOT. ORG. C 4.0 - 19; BOD <1.0 - 15; COD 24 - 127; CYANIDE 0.002 - 0.02; PHENOLS <0.001 - 0.004; Ca 0.13 - 68; Cl 2.97 - 98; Fe 0.2 - 3.2; [illegible] - 15.7; Mn [illegible] - 0.4; SPEC. COND. 43.3 - 150; SECCHI DISK 15 IN.; WATER TRANSPARENCY 27 CM; [illegible] - 0.40; Si 5.2 - 22.9; Na 2.4 - 72; SO_4 0 - 270; F 0.47 - 0.52; [illegible] - 7 µG/L; [illegible] - 5 µG/L; Pb 1 - 50 µG/L; Hg 0.05 - 1.6 µG/L; Zn 6.2 - 74 µG/L; [illegible] - 9.3 µG/L

[illegible] HIGH SILT AND SUSPENDED ORGANIC MATTER

[illegible] MODERATE POLLUTION TOLERANCE

[illegible] COMPRISED 15.8% OF TOTAL CATCH AT LOCK 19 ALONG MISSISSIPPI RIVER

[illegible] ALABAMA, APALACHICOLA, AND SAVANNAH RIVERS IN SOUTHEASTERN UNITED STATES

[illegible] SPECIES DIVERSITY [illegible] - 4.19

Hydropsychidae *Hydropsyche oslari* Banks

	SOURCE	82	190	195	217	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X	X		
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM			X	X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C					
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0			X		7.4 - 8.2
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL			X		60
	NITRATES			X		2.4
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO			X		0.05
	TOTAL					
	SEASONAL L			X		APRIL - NOVEMBER
	DISTRIBUTION A		X	X	X	JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII		X	X		
	REGION IX	X				
	REGION X	X				

STATES AND PROVINCES MENTIONED: BRIT. COL., MT. WESTERN U.S. AND BAJA CALIFORNIA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (195) SESTON CHLOROPHYLL a 2.3 X 10^{-3}; COLIFORMS 55/100 ML; TOT. HARDNESS as $CaCO_3$ 41

(190) ELEVATION 2700 - 5110 FT

(217) WIDESPREAD THROUGH WESTERN MONTANE REGION

Hydropsychidae *Hydropsyche phalerata* Hagen

	SOURCE / PARAMETERS	210	113	104	228	NOTES OR RANGES
	LARVAE	X	X		X	
	ADULT	X				
GENERAL HABITAT	LAKE/POND					
	RIVER	X	X	X	X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			1.6 - 7.3
	CURRENT					
TEMP.	EUTHERMAL >30C					1.7 - 22
	MESOTHERMAL 15-30C		X			
	OLIGOTHERMAL <15C		X			
	STENOTHERMAL <5C		X			
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0		X			6.9
	ALKALIPHILOUS >=7.0		X	X		8.76
	ALKALIBIONTIC >8.5			X		
DO	DISS. OXYGEN % SAT.		X			103 - 105
	MG/L		X	X		3.5 - 10.6
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL		X	X		8.8 - 95.2
	NITRATES		X	X		0.25 - 4.43
	NITRITES		X	X		0 - 0.06*
	AMMONIA		X	X		0 - 0.41
	PHOSPHORUS ORTHO			X		0.01 - 0.55
	TOTAL		X	X		0.08 - 1.08
	SEASONAL L		X		X	APRIL - OCTOBER
	DISTRIBUTION A	X			X	APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I		X			
	REGION II					
	REGION III	X		X	X	
	REGION IV	X			X	
	REGION V	X			X	
	REGION VI					
	REGION VII				X	
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: GA, KY, IL, IN, KS, MI, MN, NC, NJ, NY, OH, PA, TN, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (113, 104) SPEC. COND. 51 - 443; TOT. HARDNESS as $CaCO_3$ 16 - 18; SUSP. SOLIDS 11.6 - 20.4; SO_4 8 - 132.25; Cl 3.8 - 26.85; Fe 0.00 - 0.24; FECAL COLIFORMS 3 - 177,000/100 ML

[228] LARGE, WARM WATER RIVERS WITH HIGH SUSPENDED ORGANIC LOAD

Hydropsychidae *Hydropsyche sacularis* Hagen

	SOURCE	210	113	245	228	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X		X	
	ADULT	X		X		
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM			X	X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			1.3 - 12
	CURRENT					
TEMP.	EUTHERMAL >30C					0 - 22.4
	MESOTHERMAL 15-30C		X			
	OLIGOTHERMAL <15C		X			
	STENOTHERMAL <5C		X			
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0		X			6.3
	ALKALIPHILOUS >=7.0		X			7.3
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.		X			89 - 110
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL		X			2.6 - 19
	NITRATES		X			0.08 - 0.4
	NITRITES		X			0 - 0.005
	AMMONIA		X			0.0 - 0.4
	PHOSPHORUS ORTHO					
	TOTAL		X			0.03 - 0.31
	SEASONAL L		X			JAN. - DEC.
	DISTRIBUTION A			X		APRIL - MAY
GEOGRAPHIC DISTRIBUTION	REGION I		X			
	REGION II					
	REGION III					
	REGION IV	X			X	
	REGION V	X			X	
	REGION VI	X		X		
	REGION VII	X				
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES [illegible]: AR, GA, IN, MA, MD, ME, MN, OK, ONT., QUE., TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: [113] SPEC. COND. 33 - 93; TOT. HARDNESS as $CaCO_3$ 13 - 25; Fe 0.07 - 0.32; SO_4 3 - 15; Cl 3.0 - 7.3
[228] WARM-WATER, SMALLMOUTH BASS TYPE STREAM

Hydropsychidae *Hydropsyche simulans* Ross

	SOURCE PARAMETERS	210	4	3	13	98	150	174	198	179	159	178	245	228	206								NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	X	X	X		X		X	X								
	ADULT	X											X		X								
GENERAL HABITAT	LAKE/POND																						
	RIVER	X	X	X	X	X	X	X-		X		X	X	X	X								
	STREAM	X	X						X				X										
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE														X								
	DETRITIVORE																						
	TURBIDITY	X				X	X		X	X			X										25 - 405
	CURRENT																						
TEMP.	EUTHERMAL >30C			X											X								0.2 - 32
	MESOTHERMAL 15-30C			X	X	X		X	X	X					X								
	OLIGOTHERMAL <15C		X	X		X		X							X								
	STENOTHERMAL <5C							X															
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0								X														6.9
	ALKALIPHILOUS >=7.0		X	X	X	X		X		X		X			X								
	ALKALIBIONTIC >8.5							X				X											8.8
DO	DISS. OXYGEN % SAT.		X	X	X	X			X														59 - 158
	MG/L		X	X	X	X		X	X	X					X								4.3 - 16.4
H_2O CHEMISTRY	ALKALINITY PHTH.				X	X					X												0 - 50
	TOTAL		X		X	X		X	X		X				X								38 - 270
	NITRATES		X	X		X					X												0.10 - 2.7
	NITRITES		X	X	X	X					X												0.000 - 0.085
	AMMONIA		X	X	X	X			X														0.01 - 0.90
	PHOSPHORUS ORTHO		X	X	X	X			X														0.0 - 2.6
	TOTAL			X					X														0.072 - 0.48
	SEASONAL L		X	X	X	X	X	X	X			X											APRIL - NOVEMBER
	DISTRIBUTION A	X													X								FEB. - NOV.
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV	X												X									
	REGION V	X					X	X						X									
	REGION VI	X							X				X	X	X								
	REGION VII	X	X	X	X	X				X													
	REGION VIII	X																					
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, CO, IL, IN, IA, KS, KY, MN, MO, MARIT., NE, OH, OK, TN, TX, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (4, 3, 13, 98, 174, 198, 179, 178, 206) COLOR 1 - 250 TCU; TOT. COLIFORMS 26 - 130,000/100 ML; FECAL COLIFORMS 110 - 600/100 ML; FECAL STREPTOCOCCI 8 - 1000/100 ML; FECAL COLI./FECAL STREPT. RATIO 0.60; TOT. DISS. SOLIDS 210 - 2420; TOT. SUSP. SOLIDS 26 - 568; ORG. N 0.40 - 2.1; ORG. C 4.0 - 30.0; BOD 1.0 - 3.5; COD 11.0 - 50; CYANIDE <0.005; PHENOLS <0.001 - 0.005; SPEC. COND. 234 - 3300; HEXANE SOL. MATERIALS 0.8 - 4.1; TOT. HARDNESS as $CaCO_3$ 189 - 474; Ca HARDNESS as $CaCO_3$ 136 - 360; Mg HARDNESS as $CaCO_3$ 15 - 32; DETERGENTS as ABS 0.1 - 0.2; SECCHI DISK 8 - 10 IN.; TOT. RESIDUE 940 - 1100; FILTERABLE RESIDUE 920 - 1100; NON-FILTERABLE RESIDUE 15 - 25; TOT. C 23; CHLOROPHYLL a 0.012; Ca 58 - 100; K 1.6 - 18; Na 7.3 - 200; Cl 5.8 - 517; F 0.1 - 0.58; SO_4 13 - 350; Si 4.4 - 10.0; Mn 0.00 - 0.42; Hg 0.05 - 1.7 μG/L; As <0.02; Zn 6.2 - 80 μG/L; Fe 0.01 - 17.9; Pb 2.0 - 15.0 μG/L; Cu 10 - 19.0 μG/L; Mg 14 - 56

(4) TURBIDITY 1.0 - 250 NTU

(150) SLIGHTLY TURBID WATER FLOWING OVER SUBSTRATE OF CLAY WITH OCCASIONAL EXPOSED GRAVEL- NORMAL WARMWATER STREAM

(228) COMMONLY COLLECTED WITH H. *phalerata* AND H. *orris*

Hydropsychidae *Hydropsyche valanis* Ross

	SOURCE		210	228	NOTES OR RANGES
	PARAMETERS				
	LARVAE			X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER			X	
	STREAM		X		
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C			
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0			
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A	X		MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV			X	
	REGION V		X	X	
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: IL, IN, IA, KY, MN, OH, TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228) LARGE, WARM-WATER RIVERS WITH HIGH ORGANICS, COLLECTED WITH *H. orris*, *H. dicantha*, AND *H. cheilonis*

Hydropsychidae *Hydropsyche venularis* Banks

	SOURCE PARAMETERS	130	254	228	NOTES OR RANGES
	LARVAE			X	
	ADULT				
GENERAL HABITAT	LAKE/POND				
	RIVER	X	X	X	
	STREAM	X		X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON		X	X	
	EMBENTHIC IN				
	EPILITHIC ROCK		X	X	
	EPIPHYTIC PLANT			X	
	OTHER				
HOME	RETREAT BUILDER		X		
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE		X		
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY	X			4 - 51
	CURRENT	X	X		36.6 - 68 CM/S
TEMP.	EUTHERMAL >30C				2.5 - 26.5
	MESOTHERMAL 15-30C	X			
	OLIGOTHERMAL <15C	X			
	STENOTHERMAL <5C	X			
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0	X			6.4
	ALKALIPHILOUS >=7.0	X			7.0
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L	X			5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL	X			5 - 80
	NITRATES	X			0.04 - 1.84
	NITRITES	X			0.00 - 0.01
	AMMONIA				
	PHOSPHORUS ORTHO				
	TOTAL				
	SEASONAL L			X	
	DISTRIBUTION A				
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II			X	
	REGION III				
	REGION IV	X	X	X	
	REGION V			X	
	REGION VI				
	REGION VII			X	
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES RECORDED: GA, KY, MD, NC, NY, TN, VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 33 (228) MEDIUM SIZED RIVERS WITH LARGE RIFFLES. COLLECTED WITH *H. morosa*, *H. sparna*, & *H. bronta*.

Hydropsychidae

Macronema carolina (Banks)

	SOURCE	[illegible]	14	130	25	252	245	275	NOTES OR RANGES
	PARAMETERS								
	LARVAE		X		X	X		X	
	ADULT	X					X		
GENERAL HABITAT	LAKE/POND								
	RIVER		X	X	X			X-	
	STREAM				X	X	X		
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON				X	X		X	
	ENBENTHIC IN								
	EPILITHIC ROCK							X	
	EPIPHYTIC PLANT				X	X			
	OTHER								
NATURE	RETREAT BUILDER				X	X		X	
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE							X	
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT					X			101 CM/S
TEMP.	EURYTHERMAL >30C								7.0 - 26.5
	MESOTHERMAL 15-30C		X	X	X				
	OLIGOTHERMAL <15C			X					
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0				X				
	ALKALIPHILOUS >=7.0		X		X				7.8
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								5.5 - 12.4
	MG/L		X	X					
H₂O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL		X	X					10 - 80
	NITRATES		X	X					0.01 - 2.79
	NITRITES		X	X					0.00 - 0.35
	AMMONIA		X						0.02
	PHOSPHORUS ORTHO								
	TOTAL		X						0.04
	SEASONAL		X		X				JAN. - DEC.
	DISTRIBUTION								
GEOGRAPHICAL DISTRIBUTION	REGION I								
	REGION II							X	
	REGION III							X	
	REGION IV		X	X	X	X		X	
	REGION V							X	
	REGION VI						X	X	
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, AL, FL, GA, IL, IN, LA, NY, OK, PA, SC; NEW YORK TO FLORIDA AND WEST TO OKLAHOMA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (14) SPEC. COND. 43; BOD 0.3; FECAL COLIFORMS [illegible] ML; Fe<.05; Mn <0.05

([illegible]) FEELS THAT DISTRIBUTION OF *Macronema* SPECIES MAY BE INFLUENCED MORE BY FEEDING HABITATS RATHER THAN STRICT WATER QUALITY PARAMETERS

([illegible]) ELEVATION GREATER THAN 200 METERS

Hydropsychidae *Parapsyche almota* Ross

	SOURCE	43	125	209	217	275	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X	X			X	
	ADULT		X	X	X		
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM	X	X	X		X	
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON		X				
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT		X				
	OTHER						
HOME	RETREAT BUILDER					X	
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY	X					14
	CURRENT					X	STRONG
TEMP.	EUTHERMAL >30C						0 - 17
	MESOTHERMAL 15-30C	X					
	OLIGOTHERMAL <15C	X					
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0	X					7.6
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L	X					12.0
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL	X					112
	NITRATES	X					6.0
	NITRITES	X					0.079
	AMMONIA	X					0.9
	PHOSPHORUS ORTHO						
	TOTAL	X					0.124
SEASONAL DISTRIBUTION	L	X					FEBRUARY
	A		X	X			APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII		X				
	REGION IX		X				
	REGION X	X	X	X	X		

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, CO, ID, NV, OR, UT, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (43) SPEC. COND. 150; BOD 40; COD 20; TOT. ORG C 26.4; Fe 0.67; Mn 0.004; K 11.7; Na 107; TOT. KJ. N 7.1

Hydropsychidae *Parapsyche cardis* Ross

	SOURCE	130	283	244	209	275	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X	X		X	
	ADULT				X		
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM	X	X	X		X	
	SPRING	X					
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER					X	
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY	X	X				0 - 31
	CURRENT	X					16.6 - 41.1 CM/S
TEMP.	EUTHERMAL >30C						0 - 23.8
	MESOTHERMAL 15-30C	X	X	X			
	OLIGOTHERMAL <15C	X	X	X			
	STENOTHERMAL <5C	X	X	X			
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0	X	X	X			5.9
	ALKALIPHILOUS >=7.0	X					7.1
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L	X	X	X			7.0 - 12.8
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL	X	X	X			12 - 20
	NITRATES	X					0.00 - 0.56
	NITRITES	X					0.00 - 0.01
	AMMONIA	X					0.1 - 0.76
	PHOSPHORUS ORTHO						
	TOTAL	X	X				4.35 - 200 µG/L
	SEASONAL %						
	DISTRIBUTION %				X		COLD
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III					X	
	REGION IV	X	X	X	X	X	
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES REPORTED: GA, NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130, 283, 244) SPEC. COND. 8 - 31; FREE ACIDITY 1.5 - 5.0; TOT. HARDNESS as CaCO3 7 - 20; SO4 2 - 5.8; Ca 0.47 - 1.877; Mg 0.213 - 0.840; K 0.521 - 0.610; Na 1.020 - 1.107

Hydropsychidae *Potamyia flava* (Hagen)

	SOURCE	[illegible]	NOTES ON RANGES
	PARAMETERS		
	LARVAE	[illegible]	
	ADULT	[illegible]	
GENERAL HABITAT	LAKE/POND		[illegible]
	RIVER	[illegible]	
	STREAM	[illegible]	
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC [illegible]	[illegible]	
	ENDOBENTHIC [illegible]		
	EPILITHIC ROCK	[illegible]	
	EPIPHYTIC PLANT		
	OTHER	[illegible]	[illegible]
HOME	RETREAT BUILDER	[illegible]	
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY	[illegible]	[illegible]
	CURRENT	[illegible]	[illegible]
TEMP.	OLIGOTHERMAL [illegible]	[illegible]	[illegible]
	MESOTHERMAL [illegible]	[illegible]	
	POLYTHERMAL [illegible]	[illegible]	
	EURYTHERMAL [illegible]		
pH	[illegible]		
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]		
DO	DISS. OXYGEN % SAT.	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	ALKALINITY [illegible]		
	[illegible]	[illegible]	[illegible]
	CHLORIDES	[illegible]	[illegible]
	SULFATES	[illegible]	[illegible]
	AMMONIA	[illegible]	[illegible]
	PHOSPHORUS [illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	SEASONAL [illegible]	[illegible]	[illegible]
	DISTRIBUTION [illegible]	[illegible]	[illegible]
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II		
	REGION III	[illegible]	
	REGION IV	[illegible]	
	REGION V	[illegible]	
	REGION VI	[illegible]	
	REGION VII	[illegible]	
	REGION VIII	[illegible]	
	REGION IX		
	REGION X		

[illegible]

[illegible]

[illegible]

[illegible]

Hydropsychidae *Symphitopsyche alhedra* Ross

	SOURCE		228	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER		X	
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	VERY LITTLE
	CURRENT		X	MEDIUM TO FAST
TEMP.	EUTHERMAL	>30C		FAIRLY COOL
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C		
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L	X	NOVEMBER - MARCH
	DISTRIBUTION	A	X	APRIL
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV		X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: NC, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228) TROUT STREAM, OFTEN ASSOCIATED WITH *Arctopsyche irrorata*

Hydropsychidae *Symphitopsyche amblis* Ross

	SOURCE	6	209	217	NOTES OR RANGES
	PARAMETERS				
	LARVAE				
	ADULT	X	X	X	
GENERAL HABITAT	LAKE/POND			X	
	RIVER	X			
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL >30C				11.4
	MESOTHERMAL 15-30C				
	OLIGOTHERMAL <15C	X			
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0				
	ALKALIPHILOUS >=7.0				
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL				
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO				
	TOTAL				
	SEASONAL L				
	DISTRIBUTION A	X	X	X	MAY - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X	X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (6) ELEVATION 650 FT

Hydropsychidae *Symphitopsyche bifida* Banks

	SOURCE	210	116	118	36	12	23	98	121	148	150	189	193	237	234	62	179	183	228	236			NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X	X	X		X	X	X	X	X	X	X		X	X	X	X		X	X			
	ADULT	X			X						X		X					X					
GENERAL HABITAT	LAKE/POND										X												MARSH
	RIVER					X	X	X-		X					X		X		X	X			
	STREAM	X		X								X		X		X							
	SPRING													X									
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																			X			
	EMBENTHIC IN																						
	EPILITHIC ROCK																			X			
	EPIPHYTIC PLANT																						
	OTHER																			X			MUD
HOME	RETREAT BUILDER										X												
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE													X									
	OMNIVORE																						
	DETRITIVORE													X									
	TURBIDITY							X		X										X			0 - 299
	CURRENT																			X			0 - 2.4 FT/S
TEMP.	EUTHERMAL >30C																						0 - 24
	MESOTHERMAL 15-30C							X		X				X			X			X			
	OLIGOTHERMAL <15C							X		X				X						X			
	STENOTHERMAL <5C																			X			
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																						
	ALKALIPHILOUS >=7.0							X		X				X			X						7.1 - 8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.							X															61 - 146
	MG/L					X		X	X	X				X			X						4.5 - 16.4
H_2O CHEMISTRY	ALKALINITY PHTH.							X															0 - 5
	TOTAL							X		X		X		X						X			26.7 - 269
	NITRATES							X		X				X									<0.1 - 3.6
	NITRITES							X															0.000 - 0.110
	AMMONIA							X								X	X						<0.10 - 5.54
	PHOSPHORUS ORTHO							X		X						X				X			0.00 - 6.0
	TOTAL																						
	SEASONAL L					X	X	X		X	X			X			X		X				JAN. - DEC.
	DISTRIBUTION A	X			X																		MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I				X	X													X				
	REGION II	X									X							X	X				
	REGION III											X											
	REGION IV											X		X					X				
	REGION V	X		X			X		X	X									X				
	REGION VI	X						X											X				
	REGION VII																X						
	REGION VIII	X	X																X	X			
	REGION IX																						
	REGION X																		X				

STATES AND PROVINCES MENTIONED: BRIT. COL., CO, IA, IL, IN, KY, MN, MI, MO, NH, NY, OK, OH, ONT., SASK., TN, UT, VA, WI, WY, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (12, 98, 148, 189, 237, 62, 179, 236) BOD 1.4 - 15; Mg HARDNESS as $CaCO_3$ 0 - 119; Ca HARDNESS as $CaCO_3$ 0 - 159; TOT. HARDNESS as $CaCO_3$<50 - 260; DETERGENTS as ABS 0.0 - 0.2; COLIFORMS <2 - 1000/100 ML; FECAL STREPT. <2 - 410/100 ML; COLOR 1 - 11; FREE CO_2 2.7 - 4.5; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; SPEC. COND. 0 - 449; Fe 0.00 - 0.22; Si 1 - 10.0; SO_4 0 - 39; Cl 2.5 - 50; Mn 0.00 - 0.01; Na 2.3 - 7.9; K 0.5 - 2.0; F 0.0 - 1.4

(228) RICH IN SUSPENDED ORGANIC MATTER; UNIVOLTINE. NORTHERN RANGE, DOUBTS EXTENDS INTO TENNESSEE.

(116, 12) FACULTATIVE POLLUTION TOLERANCE CLASSIFICATION

Hydropsychidae *Symphitopsyche bronta* Ross

	SOURCE	210	154	113	167	183	245	228	NOTES OR RANGES
	PARAMETERS								
	LARVAE	X	X	X				X	
	ADULT				X	X	X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER			X	X				
	STREAM	X	X				X	X	
	SPRING	X							
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY			X					0.8 - 14
	CURRENT								
TEMP.	EUTHERMAL >30C								0.0 - 24.5
	MESOTHERMAL 15-30C			X	X				
	OLIGOTHERMAL <15C			X	X				
	STENOTHERMAL <5C			X	X				
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0		X	X					6.2
	ALKALIPHILOUS >=7.0				X				8.2
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.				X				87 - 130
	MG/L			X					8.5 - 12.7
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL			X	X				1.6 - 140
	NITRATES		X	X					0.01 - 0.20
	NITRITES			X					0.0
	AMMONIA		X	X					0.0 - 0.3
	PHOSPHORUS ORTHO		X						<0.001 MEQ/L
	TOTAL			X					0.03 - 0.16
	SEASONAL L			X				X	JAN. - DEC.
	DISTRIBUTION A	X	X						APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			X				X	
	REGION II					X		X	
	REGION III	X						X	
	REGION IV							X	
	REGION V	X			X			X	
	REGION VI						X		
	REGION VII								
	REGION VIII	X							
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, IL, IN, MD, MI, MA, NY, NEW BRUNS., OH, ONT., PA, VA, WY. NEW HAMPSHIRE TO TENNESSEE AND NORTH CAROLINA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.95; REST IN MEQ/L Na 0.054; K 0.008; Ca 0.209; Mg 0.056; NH_4 0.004; HCO_3 0.187; SO_4 0.053; Cl 0.024; NO_3 0.007

(113, 167) TOT. HARDNESS as $CaCO_3$ 10 - 250; SPEC. COND. 39 - 48; TOT. COLIFORMS 2 - 323 PER 100 ML; FREE CO_2 0.0 - 10.0; Cl 3.2 - 120; SO_4 6 - 10; Fe 0.05 - 0. .8; MEAN STREAM WIDTH 4 - 13 METERS

(228) TWO DISTINCT LARVAL FORMS

Hydropsychidae *Symphitopsyche centra* (Ross)

	SOURCE	235	217	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X		
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER	X		
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		0.3 - 180 NTU
	CURRENT			
TEMP.	EUTHERMAL >30C			2.6 - 26
	MESOTHERMAL 15-30C	X		
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C	X		
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0	X		6.0
	ALKALIPHILOUS >=7.0	X		8.2
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H$_2$O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL			
	NITRATES	X		<0.05 - 0.5
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO	X		<0.02 - 0.05
	TOTAL	X		0.02 - 0.86
	SEASONAL DISTRIBUTION L			
	A		X	MAY - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06; ELEVATION 300 - 1500 FT

Hydropsychidae *Symphitopsyche cockerelli* (Banks)

	SOURCE	63	190	195	NOTES OR RANGES
	PARAMETERS				
	LARVAE	X		X	
	ADULT	X	X		
GENERAL HABITAT	LAKE/POND				
	RIVER	X	X		
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL >30C				18
	MESOTHERMAL 15-30C	X			
	OLIGOTHERMAL <15C				
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0				
	ALKALIPHILOUS >=7.0			X	7.4
	ALKALIBIONTIC >8.5			X	8.8
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL	X			60 - 120
	NITRATES	X			1.2 - 2.3
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO	X			0 - 0.25
	TOTAL				
	SEASONAL L			X	JAN. - DEC.
	DISTRIBUTION A		X		MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII		X	X	
	REGION IX				
	REGION X	X			

STATES AND PROVINCES MENTIONED: WA, MT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (63) RADIONUCLIDES IN LARVAE IN PICOCURIES PER GRAM WET WT. Na^{24} 120 - 710; P^{32} 4200 - 2400; Sc^{46} 56 - 71; Cr^{51} 860 - 6000; Mn^{54} 79 - 100; Fe^{59} 19; Co^{60}2 - 30; Cu^{64} 310 - 7100; Zn^{65} 730 - 2000; As^{76} 150 - 520; Ru^{103} 110; Ba^{140} 42; La^{140} 170 - 350; Np^{239} 310

(195) SESTON CHLOROPHYLL a 1.8 - 2.5 X 10^{-3}; COLIFORMS 55 - 150/100 ML; TOT. HARDNESS as $CaCO_3$ 41 - 43

(190) ELEVATION 3100 - 3880 FT

Hydropsychidae *Symphitopsyche macleodi* Flint

	SOURCE		244	228	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X	X	
	ADULT			X	
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM		X		
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			5 - 15
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0	X		6.3 - 6.9
	ALKALIPHILOUS	>=7.0			
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L	X		8.8 - 10.6
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL	X		2.2 - 4.5
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L		X	JANUARY - JUNE
	DISTRIBUTION	A		X	APRIL - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV			X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X		X		

STATES AND PROVINCES MENTIONED: GA, NC, TN, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244) SPEC. COND. 8 - 20; PHTH. ACIDITY as $CaCO_3$ 2.0 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 24; SO_4 ND - 5.8

Hydropsychidae *Symphitopsyche morosa* Hagen

	SOURCE	210	36	113	183	254	275	228	110	130													NOTES OR RANGES
	PARAMETERS																						
	LARVAE			X		X	X	X	X	X													
	ADULT	X	X		X			X		X													
GENERAL HABITAT	LAKE/POND																						
	RIVER					X		X	X	X													
	STREAM							X															
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON							X															
	EMBENTHIC IN																						
	EPILITHIC ROCK							X															
	EPIPHYTIC PLANT							X															
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY			X						X													0.8 - 30
	CURRENT									X													41 - 68 CM/S
TEMP.	EUTHERMAL >30C																						0 - 24
	MESOTHERMAL 15-30C			X						X													
	OLIGOTHERMAL <15C			X						X													
	STENOTHERMAL <5C			X						X													
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0			X						X													6.2
	ALKALIPHILOUS >=7.0			X					X														8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.			X																			87 - 110
	MG/L			X						X													5.5 - 14.6
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL			X						X													1.6 - 20
	NITRATES			X						X													0.01 - 0.40
	NITRITES			X						X													0.0 - 0.005
	AMMONIA			X						X													0.0 - 0.40
	PHOSPHORUS ORTHO																						
	TOTAL			X						X													0.02 - 0.31
	SEASONAL L			X				X															JAN. - DEC.
	DISTRIBUTION A		X																				AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X				X															
	REGION II	X			X			X															
	REGION III	X						X															
	REGION IV					X		X		X													
	REGION V	X						X															
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: GA, MI, MA, MN, ME, MANIT., NY, NH, NC, ONT., QUE., TN, WV, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (113, 130) SPEC. COND. 11.5 - 65; HARDNESS as $CaCO_3$ 10 - 25; Fe 0.05 - 0.32; SO_4 0 - 10; Cl 3.2 - 7.3; ELEVATION 213 METERS

(110) GIVES NUMBER OF LC_{50}'s AND LC_{90} VALUES FOR DDT, BAYTEX, DIAZINON, MALATHION, DDD, AND METHOXYCHLOR

(228) MEDIUM SIZED RIVERS TYPIFIED AS SMALL MOUTH BASS STREAMS

Hydropsychidae *Symphitopsyche recurvata* Banks

	SOURCE		210	148	193	201	234	62	183	275	228	110	NOTES OR RANGES
	PARAMETERS												
	LARVAE		X	X		X	X	X		X	X	X	
	ADULT		X		X				X		X		
GENERAL HABITAT	LAKE/POND												
	RIVER		X	X		X	X				X	X	
	STREAM							X					
	SPRING												
	TEMP. WATERS												
SPECIFIC HABITAT	EPIBENTHIC	ON	X										
	EMBENTHIC	IN											
	EPILITHIC	ROCK	X										
	EPIPHYTIC	PLANT											
	OTHER												
HOME	RETREAT BUILDER												
	CASE MAKER												
	FREELIVING												
DIET	CARNIVORE												
	HERBIVORE												
	OMNIVORE												
	DETRITIVORE												
	TURBIDITY			X				X					6.0 - 13.0
	CURRENT												
TEMP.	EUTHERMAL	>30C											11 - 24
	MESOTHERMAL	15-30C		X									
	OLIGOTHERMAL	<15C	X	X									
	STENOTHERMAL	<5C											
PH	ACIDOBIONTIC	<5.5											
	ACIDOPHILIC	<7.0											
	ALKALIPHILOUS	>=7.0		X		X						X	7.7 - 8.5
	ALKALIBIONTIC	>8.5											
DO	DISS. OXYGEN	% SAT.											
		MG/L		X		X							6.1 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.											
		TOTAL		X		X							80 - 165
	NITRATES			X		X							0.05 - 5.70
	NITRITES												
	AMMONIA					X		X					0.0 - 1.22
	PHOSPHORUS	ORTHO		X									0.03 - 0.04
		TOTAL				X							0.10 - 0.46
	SEASONAL	L		X									JUNE - OCTOBER
	DISTRIBUTION	A	X								X		MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I										X		
	REGION II		X						X				
	REGION III												
	REGION IV												
	REGION V		X	X						X	X		
	REGION VI												
	REGION VII												
	REGION VIII												
	REGION IX												
	REGION X												

STATES AND PROVINCES MENTIONED: ALB., MI, MN, NY, ONT., QUE., SASK., WI. SASK. TO MAINE AND SOUTH TO ILLINOIS

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (148, 201, 62) CO_2 6.0 - 8.0; HARDNESS as $CaCO_3$ 159 - 260; BOD 0.2 - 8.5; SPEC. COND. 183 - 282; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; Cl 3.4 - 40; SO_4 18 - 74

(110) REPORT GIVES NUMEROUS LC_{50} AND LC_{90} VALUES FOR SPECIES WITH RESPECT TO DDT, DDD, METHOXYCHLOR, BAYTEX, DIAZINON, MALATHION

(234) FOUND ABOVE, BUT NOT BELOW, STUDY RESERVOIR

(228) RIFFLE AREAS OF RIVERS, AND WAVE WASHED AREAS OF THE GREAT LAKES

Hydropsychidae *Symphitopsyche slossonae* Banks

	SOURCE	210	36	12	146	238	234	278	62	167	245	228	141	16									NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X		X	X	X	X	X	X			X	X										
	ADULT	X	X							X	X			X									
GENERAL HABITAT	LAKE/POND																						
	RIVER			X		X	X			X			X										
	STREAM	X						X	X		X			X									
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY								X														
	CURRENT												X										0.05 - 2.51 FT/S
TEMP.	EUTHERMAL >30C																						0 - 24.5
	MESOTHERMAL 15-30C									X				X									
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5													X									4.6
	ACIDOPHILIC <7.0													X									
	ALKALIPHILOUS >=7.0				X					X													8.2
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.									X				X									87 - 130
	MG/L			X	X																		8.4 - 11.0
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL				X					X													80 - 140
	NITRATES				X																		0.40
	NITRITES																						
	AMMONIA				X				X														<0.1
	PHOSPHORUS ORTHO				X				X														0.002 - 0.55
	TOTAL			X	X																		0.02 - 0.08
	SEASONAL L			X				X				X											FEBRUARY - AUG.
	DISTRIBUTION A	X	X																				MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I	X	X	X								X		X									
	REGION II	X										X											
	REGION III	X										X											
	REGION IV	X										X											
	REGION V	X				X		X		X		X	X										
	REGION VI										X	X											
	REGION VII			X																			
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, IL, MI, MN, MO, MA, ME, NH, NY, NC, NEWFOUNDLAND, OH, ONT., PA, SASK., TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (12, 146, 62, 167) BOD 2.6; COD 0; Ca HARDNESS as $CaCO_3$ 32.0; TOT. HARDNESS as $CaCO_3$ 110 - 250; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; FREE CO_2 0.0 - 10.0; TOT. COLIFORMS 2 - 323/100 ML; Cl 3.9 - 120; F 0.32; SO_4 <10; Fe <0.1; Na 0.9; K 3.1; Mn <1.0; Si 9.9

(238) IN FOUR SEPERATE EXPERIMENTAL RUNS, SPECIES SEEMED NOT TO BE ABLE TO TOLERATE O_2 LEVELS BELOW 3.6 MG/L

(234) FOUND BOTH ABOVE AND BELOW STUDY RESERVOIR

(278) DIVERSITY AT SAMPLING POINT 3.07 - 4.12 (USING MARGALEF'S DIVERSITY INDEX)

(228) OFTEN ASSOCIATED WITH *Arctopsyche irrorata*

Hydropsychidae *Symphitopsyche sparna* Ross

	SOURCE PARAMETERS	210	136	130	167	277	254	228	166	NOTES OR RANGES
	LARVAE					X	X	X		
	ADULT	X	X		X	X			X	
GENERAL HABITAT	LAKE/POND									
	RIVER			X			X	X		
	STREAM			X		X		X	X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON									
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT									
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE					X				
	TURBIDITY			X						4 - 51
	CURRENT			X		X				36.6 - 68 CM/S
TEMP.	EUTHERMAL >30C									0 - 26.5
	MESOTHERMAL 15-30C			X					X	
	OLIGOTHERMAL <15C			X					X	
	STENOTHERMAL <5C			X					X	
PH	ACIDOBIONTIC <5.5								X	4.6
	ACIDOPHILIC <7.0			X					X	
	ALKALIPHILOUS >=7.0			X						7.0
	ALKALIBIONTIC >8.5									
DO	DISS. OXYGEN % SAT.									
	MG/L			X						5.5 - 12.5
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL			X						5 - 35
	NITRATES			X						0.04 - 1.91
	NITRITES			X						0.01 - 0.10
	AMMONIA			X						0.3 - 0.76
	PHOSPHORUS ORTHO									
	TOTAL			X						0.02 - 0.20
	SEASONAL L					X		X		JAN. - DEC.
	DISTRIBUTION A		X					X		APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I		X					X	X	
	REGION II	X						X		
	REGION III	X						X		
	REGION IV	X		X			X	X		
	REGION V	X			X			X		
	REGION VI									
	REGION VII									
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: AL, GA, KY, MI, MN, ME, NY, NC, NOVA SCOTIA, NH ONT., SC, TN, VA, WI, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (130) SPEC. COND. 11.1 - 20.0; SO4 0 - 3; ELEVATION 600 - 1067 M

(277) STATISTICALLY SHOWED PREFERENCE FOR SUBSTRATE WITH STONES GREATER THAN 5 CM IN DIAMETER; HIGH MOSS VOLUME; CURRENT 20 - 40 CM/S; AND A DEPTH OF LESS THAN 10 CM

(228) WIDE RANGE OF TOLERANCE WITH RESPECT TO STREAM SIZE, FROM SMALL, SLUGGISH, ORGANIC RICH STREAMS TO FAST, CLEAN, COLD TROUT STREAMS

Hydropsychidae *Symphitopsyche ventura* Ross

	SOURCE	228	NOTES OR RANGES
	PARAMETERS		
	LARVAE	X	
	ADULT	X	
GENERAL HABITAT	LAKE/POND		
	RIVER		
	STREAM		
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON		
	ENBENTHIC IN		
	EPILITHIC ROCK		
	EPIPHYTIC PLANT		
	OTHER		
HOME	RETREAT BUILDER		
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY		
	CURRENT		
TEMP.	EUTHERMAL >30C		
	MESOTHERMAL 15-30C		
	OLIGOTHERMAL <15C		
	STENOTHERMAL <5C		
PH	ACIDOBIONTIC <5.5		
	ACIDOPHILIC <7.0		
	ALKALIPHILOUS >=7.0		
	ALKALIBIONTIC >8.5		
DO	DISS. OXYGEN % SAT.		
	MG/L		
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL		
	NITRATES		
	NITRITES		
	AMMONIA		
	PHOSPHORUS ORTHO		
	TOTAL		
	SEASONAL L	X	APRIL - JULY
	DISTRIBUTION A	X	APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II	X	
	REGION III		
	REGION IV	X	
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX		
	REGION X		

STATES AND PROVINCES MENTIONED: NY, NEWFOUNDLAND, ONT., TN, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228) PUPAE ATTACHED TO MOSS GROWING IN FASTER WATER. ALSO COLLECTED AT SITE WERE *Micrasema* sp.; *Goerita betteni*; *Diplectrona modesta*; AND OTHER *Hydropsyche*.

Symphitopsyche walkeri Betten & Mosely

	SOURCE PARAMETERS	210	36	113	167	228	NOTES OR RANGES
	LARVAE			X		X	
	ADULT	X	X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER			X		X	
	STREAM						
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY			X			1.6 - 7.3
	CURRENT						
TEMP.	EUTHERMAL >30C						0 - 22
	MESOTHERMAL 15-30C			X			
	OLIGOTHERMAL <15C			X			
	STENOTHERMAL <5C			X			
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0			X			6.6
	ALKALIPHILOUS >=7.0			X			7.3
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.			X			98 - 110
	MG/L			X			9.2 - 14.6
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL			X			6.0 - 19.0
	NITRATES			X			0.08 - 0.4
	NITRITES			X			0 - 0.005
	AMMONIA			X			0 - 0.4
	PHOSPHORUS ORTHO						
	TOTAL			X			0.03 - 0.22
	SEASONAL L			X			FEB. - DEC.
	DISTRIBUTION A		X	X		X	MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I	X				X	
	REGION II						
	REGION III						
	REGION IV	X			X	X	
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: MA, NY, NH, OH, ONT., QUE., VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (113) SPEC. COND. 35 - 65; TOT. HARDNESS as $CaCO_3$ 13 - 25; Fe 0.08 - 0.32; SO_4 6 - 10; Cl 3.6 - 5.6

(228) TROUT STREAMS, MAY PREFER FASTER MORE OXYGENATED RIFFLES WITH HIGH AMOUNT OF SUSPENDED ORGANIC MATERIAL

HYDROPTILIDAE

The hydroptilids or microcaddisflies are represented by 14 genera and approximately 170 species in America north of Mexico. The larvae of this family inhabit all kinds of lentic and lotic habitats, from spring streams to raging rivers, from small ponds to the Great Lakes. Hydroptilids range in size from 2 mm - 6 mm and construct cases only during their final larval instar. Because of their small size and due to the lack of taxonomic keys past generic level, the water quality requirements for very few species are known. We are able to get limited data for only twenty species. This represents less than twelve per cent of species present! The early instars of these case-making caddis are free living, and it is not until the final instar that most species construct a portable or fixed case.

1. Genus Agraylea Curtis

This widely distributed genus is represented by three species in North America. Larval characteristics are known for one, Agraylea multipuctata Curtis. The genus is apparently restricted to lentic habitats, occurring in lakes, ponds and only areas of quiet water in rivers and streams. They occur in conjunction with vascular plants and filamentous algae. Single strands of algae are incorporated with silk in concentric rings on their cases. We have no water quality data available for A. costello Ross, an eastern species, or A. saltesa Ross, a western species.

2. Genus Alisotrichia Flint

Only one specimen of this genus is known in the United States. Unlike other hydroptilids it apparently does not make a case but is free living up until it is nearly ready to pupate. The single specimen is from springs in southwest Utah. We have no water quality data.

3. Genus Dibusa Ross

Only one species, Dibusa angata Ross is known. It is the largest American hydroptilid, and often found to be locally abundant. The only larvae that are collected are in streams with red algae Lemanea present. The larvae utilize pieces of this algae to construct their cases. We have no water data for this species.

4. Genus Hydroptila Dalman

This is the largest hydroptilid genus in North America with over 60 species. Members of this widespread genus occur in a variety of lentic and lotic habitats. Because of their small size, very few characters have to be found to differentiate the species of this genus. Most accurate determinations are done with associated materials. We include profiles for only nine species. Larvae are known to feed on filamentous algae, diatoms, and unicellular algae. Their cases are typical purse-cases made of two silken convex valves covered with a single layer of sand.

5. Genus Ithytrichia Ross

Two species of this genus, I. clavata Morton and I. mazon Ross, are known from North America. We have no water data available for either species. Larvae are found on rocks and moss in running water habitats. I. clavata is is Holartic in distribution and I. mazon known only from Illinois. The flattened sliken case of this genus and distinctive abdomen with lateral lobes make members of this genus easy to identify.

6. Genus Leucotrichia Mosely

Three species of this genus occur in America north of Mexico. Two, L. sarita Ross and L. limpia Ross,are restricted to the southwest and are recorded only from Regions VI and IX. The third species, L. pictipes (Banks), is widespread in swift lotic habitats. The larval case is a fixed, flattened, purse-type case which adheres tightly to the rock substrate.

7. Genus Mayatrichia Mosely

Three species of this genus occur in North America with M. ayama Mosely being widespread. M. ponta Ross is known only from Oklahoma and M. acuna Ross is known only from Texas. We have water data available only for M. ayama. Larvae occur on rocks in rather large, rapid streams. Their silken cases are cylindrical, tapering posteriorly with strengthening ridges.

8. Genus Neotrichia Morton

This genus contains the truly microcaddisflies and although the genus can be diagnosed, no characters are known to distinguish their minute larvae to species. Sixteen species are known in America north of Mexico with at least one species occurring in all regions. The larvae superficially resemble Mayatrichia, but their cases are covered with sand grains. Most species of this genus have been collected from small, fairly clear streams. We are not able to find water quality data available for a single species of this genus.

9. Genus *Ochrotrichia* Mosely

This is a fairly large genus with approximately 42 species known north of Mexico. Representatives of this genus occur in all regions and most often are found in clear, rapid streams although some are even collected from temporary streams and springs. The case and larvae of the members of this genus closely resemble *Hydroptila* but can be distinguished from them by lack of apical gills. We include profiles for four species.

10. Genus *Orthotrichia* Eaton

This algae feeding genus has six North American species and we include water data for one eastern species, *O. americana* (Banks). Larvae of this genus are easily recognized by their unique pointed, asymetrical labrum and bare silken case. The genus is restricted to slow moving waters, lakes and ponds. There is no key to larvae of this genus.

11. Genus *Oxyethira* Eaton

Although about 30 species of this rather widespread genus are known from North America, we have water data for only one species, *O. pallida* (Banks). The unique legs and flattened bottle-shaped silk case distinguish members of this genus which are restricted to lentic or slow moving water habitats. Larvae feed on plant material.

12. Genus *Palaeagepetus* Ulmer

Three species of this primitive genus are known for North America. We include limited water data on *P. celsus* Ross. The genus is restricted to cold, mountain seepage springs with the larval case being covered with small pieces of liverwort. The larvae have been collected on moist rocks in seepage areas above water level.

13. Genus *Stactobiella* Martynov

Three locally abundant species of this genus occur in North America in lotic environments. No water quality data is available for this genus which seems to be restricted to riffle areas of small streams.

14. Genus *Zumatrichia* Mosely

Only one species of this genus is known from North America. *Z. notosa* Ross is found in Montana. The larvae are apparently found in fast flowing waters of large rivers. The fifth instars build a non-portable silk case on rocks. We have no water quality data for this genus.

Hydroptilidae *Agraylea multipunctata* Curtis

	SOURCE PARAMETERS		210	36	32	41	10	148	190	199	200	234	167	183	217	275	NOTES OR RANGES
	LARVAE		X			X	X	X	X	X	X	X				X	
	ADULT		X	X	X		X						X	X	X		
GENERAL HABITAT	LAKE/POND						X									X	
	RIVER		X			X	X	X	X			X				X	
	STREAM																
	SPRING																
	TEMP. WATERS																
SPECIFIC HABITAT	EPIBENTHIC	ON														X	
	EMBENTHIC	IN															
	EPILITHIC	ROCK															
	EPIPHYTIC	PLANT														X	
	OTHER																
HOME	RETREAT BUILDER																
	CASE MAKER						X									X	
	FREELIVING																
DIET	CARNIVORE																
	HERBIVORE						X									X	
	OMNIVORE																
	DETRITIVORE																
	TURBIDITY							X									8.0
	CURRENT																
TEMP.	EUTHERMAL	>30C															0 - 24
	MESOTHERMAL	15-30C				X		X			X						
	OLIGOTHERMAL	<15C				X											
	STENOTHERMAL	<5C															
PH	ACIDOBIONTIC	<5.5															
	ACIDOPHILIC	<7.0				X											6.9
	ALKALIPHILOUS	>=7.0				X		X									
	ALKALIBIONTIC	>8.5				X											8.9
DO	DISS. OXYGEN	% SAT.									X						70 - 90
		MG/L															
H_2O CHEMISTRY	ALKALINITY	PHTH.															
		TOTAL															
	NITRATES																
	NITRITES																
	AMMONIA																
	PHOSPHORUS	ORTHO															
		TOTAL															
	SEASONAL	L						X			X					X	JUNE - SEPTEMBER
	DISTRIBUTION	A		X			X		X								MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X	X											X	
	REGION II		X											X		X	
	REGION III		X													X	
	REGION IV															X	
	REGION V		X					X								X	
	REGION VI												X				
	REGION VII															X	
	REGION VIII		X						X							X	
	REGION IX															X	
	REGION X																

STATES AND PROVINCES MENTIONED: BRIT. COL., CO, IL, KY, ME, MT, MANIT., MI, MN, NH, NY, NOVA SCOTIA, N.W. TERR., OH, ONT., SD, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (200) SPEC. COND. 410 - 500

(199) SURVIVED RESERVOIR DRAINAGE AND EXPOSURE TO WINTER COLD, RESULTING IN THE FREEZING OF THE SUBSTRATE. DURING THIS TIME AIR TEMPERATURE RANGED FROM -22° C TO 5° C.

(10, 190) ELEVATION 3140 - 7200 FT

(217) WIDESPREAD ACROSS NORTH AMERICA

Hydroptilidae *Hydroptila albicornis* Hagen

	SOURCE PARAMETERS	210	32	146	245																		NOTES OR RANGES
	LARVAE	X		X																			
	ADULT				X																		
GENERAL HABITAT	LAKE/POND																						
	RIVER	X																					
	STREAM																						
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																						
	ALKALIPHILOUS >=7.0																						
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL																						
	NITRATES			X																			0.35
	NITRITES																						
	AMMONIA			X																			<0.10
	PHOSPHORUS ORTHO			X																			0.10
	TOTAL			X																			0.12
	SEASONAL L																						
	DISTRIBUTION A																						
GEOGRAPHIC DISTRIBUTION	REGION I		X																				
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V	X																					
	REGION VI				X																		
	REGION VII	X		X																			
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, IL, IN, ME, MO, ONT., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Hydroptilidae *Hydroptila armata* Ross

	SOURCE / PARAMETERS	210	102	146	148	167	183	245	NOTES OR RANGES
	LARVAE	X	X	X	X				
	ADULT					X	X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER		X		X	X			
	STREAM	X							
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER	X							
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY				X				8.0
	CURRENT		X						SWIFT
TEMP.	EUTHERMAL >30C								20
	MESOTHERMAL 15-30C				X				
	OLIGOTHERMAL <15C								
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0				X	X			7.1 - 8.0
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.					X			87 - 130
	MG/L								
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL					X			30 - 120
	NITRATES				X				0.16
	NITRITES								
	AMMONIA				X				0.04
	PHOSPHORUS ORTHO				X				0.11
	TOTAL				X				0.11
	SEASONAL L		X		X				JULY - AUGUST
	DISTRIBUTION A	X							MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II						X		
	REGION III								
	REGION IV		X						
	REGION V	X			X	X			
	REGION VI	X						X	
	REGION VII			X					
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, IL, IN, MI, MO, OH, OK, NY, TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 8.0; TOT. HARDNESS as $CaCO_3$ 110 - 230; TOT. COLIFORMS MEAN OF 2/100 ML; Cl 40 - 120; MEAN STREAM WIDTH 5 - 6 METERS

Hydroptilidae *Hydroptila consimilis* Morton

	SOURCE		210	32	41	154	10	146	62	167	183	245	217	141										NOTES OR RANGES
	PARAMETERS																							
	LARVAE		X		X	X		X	X					X										
	ADULT		X	X			X			X	X	X	X											
GENERAL HABITAT	LAKE/POND																							
	RIVER				X		X			X		X		X										
	STREAM		X			X			X			X	X											
	SPRING																							
	TEMP. WATERS																							
SPECIFIC HABITAT	EPIBENTHIC	ON												X										
	EMBENTHIC	IN																						
	EPILITHIC	ROCK												X										
	EPIPHYTIC	PLANT																						
	OTHER													X										SAND
HOME	RETREAT BUILDER																							
	CASE MAKER						X																	SILK AND SAND
	FREELIVING																							
DIET	CARNIVORE																							
	HERBIVORE																							
	OMNIVORE																							
	DETRITIVORE																							
	TURBIDITY								X															2.6 - 77.4
	CURRENT													X										0.05 - 1.91 FT/S
TEMP.	EUTHERMAL	>30C																						0 - 30
	MESOTHERMAL	15-30C			X				X															
	OLIGOTHERMAL	<15C			X																			
	STENOTHERMAL	<5C																						
PH	ACIDOBIONTIC	<5.5																						
	ACIDOPHILIC	<7.0				X																		6.8
	ALKALIPHILOUS	>=7.0			X				X	X														
	ALKALIBIONTIC	>8.5							X															9.1
DO	DISS. OXYGEN	% SAT.																						90 - 115
		MG/L																						
H_2O CHEMISTRY	ALKALINITY	PHTH.																						
		TOTAL								X														40 - 117
	NITRATES					X		X	X															0.10
	NITRITES								X															SEE COMMENTS
	AMMONIA					X		X																0.18
	PHOSPHORUS	ORTHO				X		X	X															0 - 0.11
		TOTAL						X																0.15
	SEASONAL	L	X			X																		MAY - AUGUST
	DISTRIBUTION	A	X	X			X					X												APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			X																				
	REGION II		X				X				X													
	REGION III		X				X																	
	REGION IV		X				X																	
	REGION V		X				X			X				X										
	REGION VI		X				X																	
	REGION VII						X	X																
	REGION VIII		X				X																	
	REGION IX		X																					
	REGION X		X				X																	

STATES AND PROVINCES MENTIONED: AR, AZ, BRIT. COL., IL, ME; MO, NY, NEW BRUNS., N.W. TERR., OK, OR, ONT., TN, TX, VT, VA, WI, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) MEQ/L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; NH_4 0.003; HCO_3 0.235; SO_4 0.052; Cl 0.025; NO_3 0.007; $H_2PO_4 < 0.001$ SUSP. SED. 0.78 MG/L

(62, 167) $NO_2 + NO_3$ 0.01 - 0.47; FREE CO_2 0.0 - 8.5; TOT. COLIFORMS 3 - 7 500 000/100 ML; ORG. C 4.0 - 17.0; TOT. DDT 0 - 0.10 µG/L; PCB 0 - 0.25 µG/L; PHENOXYS 0 - 2.81 µG/L; SPEC. COND. 243 - 473; TOT. KJ. N 0.58 - 1.8; Na 2.0 - 9.7; Cl 35 - 75; K 1.2 - 8.3; SO_4 26.0; As 0.01 - 0.20; Cd 0.01 - 0.02; Cu 0.03 - 0.18; Pb 0.01 - 0.02

(62) APPROXIMATELY 2 MONTHS PER YEAR OF NO FLOW BETWEEN POOLS IN THE STREAM. THERE WERE ALSO DENSE GROWTHS OF *Cladophora* DURING THE SUMMER.

(217) NORTHERN, TRANSCONTINENTAL

Hydroptilidae

Hydroptila hamata Morton

	SOURCE		210	36	32	10	235	167	141	NOTES OR RANGES
	PARAMETERS									
	LARVAE		X				X		X	
	ADULT		X	X	X	X		X		
GENERAL HABITAT	LAKE/POND		X			X				
	RIVER		X			X	X		X	
	STREAM		X							
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON							X	
	EMBENTHIC	IN								
	EPILITHIC	ROCK								
	EPIPHYTIC	PLANT								
	OTHER								X	SAND
HOME	RETREAT BUILDER									
	CASE MAKER					X				
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY						X			0.3 - 180 NTU
	CURRENT								X	0.4 - 0.48 FT/S
TEMP.	EUTHERMAL	>30C								2.6 - 26
	MESOTHERMAL	15-30C					X			
	OLIGOTHERMAL	<15C					X			
	STENOTHERMAL	<5C					X			
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0					X			6.0
	ALKALIPHILOUS	>=7.0					X			8.2
	ALKALIBIONTIC	>8.5								
DO	DISS. OXYGEN	% SAT.								
		MG/L								
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL								
	NITRATES						X			<0.05 - 0.5
	NITRITES									
	AMMONIA									
	PHOSPHORUS	ORTHO					X			<0.02 - 0.05
		TOTAL					X			0.02 - 0.86
	SEASONAL DISTRIBUTION	L								
		A		X	X					JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			X	X					
	REGION II		X			X				
	REGION III		X			X				
	REGION IV		X			X				
	REGION V		X			X		X	X	
	REGION VI		X			X				
	REGION VII		X			X				
	REGION VIII		X			X				
	REGION IX		X			X				
	REGION X		X			X	X			

STATES AND PROVINCES MENTIONED: AR, AZ, IL, IN, KY, ME, MI, MO, NH, NM, NY, NC, OH, OK, OR, ONT., PA, TX, VA, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; Si 9.1 - 47.6; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1;Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 3.0 - 78; Fl 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; ELEVATION 360 - 1500 FT

Hydroptilidae *Hydroptila jackmanni* Blickle

	SOURCE PARAMETERS		32	31	167	NOTES OR RANGES
	LARVAE					
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER				X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0			X	7.0 - 8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.			X	87 - 130
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL			X	30 - 120
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X		JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X		
	REGION II					
	REGION III					
	REGION IV					
	REGION V				X	
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: ME, NH, OH

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 8.5; TOT. HARDNESS as $CaCO_3$ 110 - 240; TOT. COLIFORMS 2 - 3/100 ML; Cl 35 - 120; MEAN STREAM WIDTH 4 - 7 M

Hydroptilidae *Hydroptila perdita* Morton

	SOURCE / PARAMETERS	210	146	167	183	245	NOTES OR RANGES
	LARVAE		X				
	ADULT	X		X	X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X					
	STREAM	X					
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL >30C						
	MESOTHERMAL 15-30C						
	OLIGOTHERMAL <15C						
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0						
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L						
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL						
	NITRATES		X				0.35
	NITRITES						
	AMMONIA		X				<0.10
	PHOSPHORUS ORTHO		X				0.10
	TOTAL		X				0.12
	SEASONAL L						
	DISTRIBUTION A	X					MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II	X			X		
	REGION III	X					
	REGION IV						
	REGION V	X		X			
	REGION VI	X				X	
	REGION VII		X				
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, IL, MI, MO, NY, OH, ONT., PA

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Hydroptilidae *Hydroptila rono* Ross

	SOURCE PARAMETERS	5	10	241	217	NOTES OR RANGES
	LARVAE	X		X		
	ADULT	X	X		X	
GENERAL HABITAT	LAKE/POND					
	RIVER	X	X		X	
	STREAM		X	X		
	SPRING		X			
	TEMP. WATERS		X			
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER	X	X			
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY	X				0.2 - 3.6
	CURRENT	X				71 CM/S
TEMP.	EUTHERMAL >30C					6 - 13.5
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C	X				
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0	X				7.3 - 7.6
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL	X				53 - 58
	NITRATES	X				0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO	X				0.2 - 0.57
	TOTAL					
	SEASONAL L	X				JAN. - DEC.
	DISTRIBUTION A	X	X			MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII		X			
	REGION IX					
	REGION X	X	X	X		

STATES AND PROVINCES MENTIONED: BRIT. COL., OR, UT, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN STREAM WIDTH 30.5 M; MEAN DEPTH 21.3 CM

(217) WIDESPREAD WESTERN MONTANE

Hydroptilidae *Hydroptila spatulata* Morton

	SOURCE		210	146	188	183	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X	X	X		
	ADULT		X			X	
GENERAL HABITAT	LAKE/POND						
	RIVER		X				
	STREAM				X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0			X		8.2 - 8.5
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.			X		120 - 160
		MG/L					
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES			X			0.35
	NITRITES						
	AMMONIA			X			0.10
	PHOSPHORUS	ORTHO		X			0.10
		TOTAL		X			0.12
	SEASONAL	L			X		MARCH - APRIL
	DISTRIBUTION	A	X				JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II		X			X	
	REGION III						
	REGION IV				X		
	REGION V		X				
	REGION VI						
	REGION VII			X			
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, IN, KY, MI, MO, NY, QUE., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (188) ASSOCIATED WITH ALGAE *Lemanea*

Hydroptila waubesiana Betten

	SOURCE	210	30	39	65	174	190	167	183	261	245	141	NOTES OR RANGES
	PARAMETERS												
	LARVAE	X				X	X					X	
	ADULT	X	X		X		X	X	X	X	X		
GENERAL HABITAT	LAKE/POND	X		X	X								
	RIVER	X				X	X			X	X	X	
	STREAM	X											
	SPRING												
	TEMP. WATERS												
SPECIFIC HABITAT	EPIBENTHIC ON												
	EMBENTHIC IN												
	EPILITHIC ROCK												
	EPIPHYTIC PLANT												
	OTHER												
HOME	RETREAT BUILDER												
	CASE MAKER												
	FREELIVING												
DIET	CARNIVORE												
	HERBIVORE												
	OMNIVORE												
	DETRITIVORE												
	TURBIDITY					X							25 - 250
	CURRENT											X	0.05 - 0.89 FT/S
TEMP.	EUTHERMAL >30C												23 - 24.9
	MESOTHERMAL 15-30C			X		X							
	OLIGOTHERMAL <15C												
	STENOTHERMAL <5C												
PH	ACIDOBIONTIC <5.5												
	ACIDOPHILIC <7.0			X		X							6.8
	ALKALIPHILOUS >=7.0					X							7.2
	ALKALIBIONTIC >8.5												
DO	DISS. OXYGEN % SAT.												
	MG/L					X							4.9 - 6.9
H_2O CHEMISTRY	ALKALINITY PHTH.												
	TOTAL					X							29 - 106
	NITRATES			X									0
	NITRITES			X									0
	AMMONIA			X									0.042
	PHOSPHORUS ORTHO			X									0
	TOTAL			X									0.289
	SEASONAL L					X							SEPT. - NOV.
	DISTRIBUTION A	X	X	X	X		X			X			MARCH - DEC.
GEOGRAPHIC DISTRIBUTION	REGION I												
	REGION II								X				
	REGION III												
	REGION IV		X			X							
	REGION V	X			X	X		X				X	
	REGION VI				X						X		
	REGION VII						X						
	REGION VIII												
	REGION IX												
	REGION X												

STATES AND PROVINCES MENTIONED: AR, FL, IA, IL, IN, MO, MI, LA, KY, MT, NY, OH, ONT., SASK., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (39) SECCHI DISK 0.9 METERS

(174) TOT. DISS. SOLIDS 126 - 478. SENSITIVE POLLUTION TOLERANCE CLASSIFICATION

(190) ELEVATION 2490 - 5110 FT

(261) LIGHT TRAP AT LOCK 19 MISSISSIPPI RIVER, COMPOSED <0.5% TOTAL

Leuchotrichia pictipes (Banks)

	SOURCE		210	10	235	275	141	NOTES OR RANGES
	PARAMETERS							
	LARVAE		X	X	X	X	X	
	ADULT		X	X			X	
GENERAL HABITAT	LAKE/POND							
	RIVER		X		X		X	
	STREAM							
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON	X	X		X		
	EMBENTHIC	IN						
	EPILITHIC	ROCK	X	X		X		
	EPIPHYTIC	PLANT						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER		X	X		X		SILK
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE			X		X		
	OMNIVORE							
	DETRITIVORE			X		X		
	TURBIDITY				X			0.5 - 180 NTU
	CURRENT						X	0.13 - 0.86 FT/S
TEMP.	EUTHERMAL	>30C						4.8 - 26
	MESOTHERMAL	15-30C			X			
	OLIGOTHERMAL	<15C			X			
	STENOTHERMAL	<5C			X			
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0			X			6.3
	ALKALIPHILOUS	>=7.0			X			8.2
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.						
		MG/L						
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL						
	NITRATES				X			<0.05 - 0.5
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO			X			<0.02 - 0.03
		TOTAL			X			0.02 - 0.86
	SEASONAL DISTRIBUTION	L		X		X		JUNE - SEPTEMBER
		A		X				JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II		X	X				
	REGION III			X		X		
	REGION IV							
	REGION V		X	X		X	X	
	REGION VI							
	REGION VII			X		X		
	REGION VIII		X	X		X		
	REGION IX			X				
	REGION X		X	X	X	X		

STATES AND PROVINCES MENTIONED: CA, CO, ID, IL, MI, MN, NY, OR, VA, WI, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 36 - 197; TOT. KJ N0.05 - 0.22; Si 9.1 - 47.6; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Fe 0 - 0.63; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.2; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 10; Cl 1.2 - 14; B 0.0 - 0.06; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; ELEVATION 360 - 880 FT

(10) VERY FAST CURRENT

Hydroptilidae *Mayatrichia ayama* Mosely

	SOURCE		210	30	32	41	3	234	261	275	NOTES OR RANGES
	PARAMETERS										
	LARVAE		X			X	X	X		X	
	ADULT		X	X	X				X		
GENERAL HABITAT	LAKE/POND										
	RIVER		X			X	X		X	X	
	STREAM		X							X	
	SPRING										
	TEMP. WATERS										
SPECIFIC HABITAT	EPIBENTHIC	ON								X	
	EMBENTHIC	IN									
	EPILITHIC	ROCK								X	
	EPIPHYTIC	PLANT									
	OTHER										
HOME	RETREAT BUILDER										
	CASE MAKER		X							X	SILKEN
	FREELIVING										
DIET	CARNIVORE										
	HERBIVORE										
	OMNIVORE										
	DETRITIVORE									X	
	TURBIDITY						X				50 - 65
	CURRENT									X	RAPID
TEMP.	EUTHERMAL	>30C									0 - 29.4
	MESOTHERMAL	15-30C				X	X				
	OLIGOTHERMAL	<15C				X					
	STENOTHERMAL	<5C									
PH	ACIDOBIONTIC	<5.5									
	ACIDOPHILIC	<7.0				X					
	ALKALIPHILOUS	>=7.0				X	X				8.4
	ALKALIBIONTIC	>8.5									
DO	DISS. OXYGEN	% SAT.									
		MG/L				X					SEE COMMENTS
H_2O CHEMISTRY	ALKALINITY	PHTH.									
		TOTAL					X				166 - 176
	NITRATES						X				0.50 - 0.73
	NITRITES						X				0.0037 - 0.0052
	AMMONIA						X				<0-01 - 0.02
	PHOSPHORUS	ORTHO									
		TOTAL					X				0.072 - 0.15
	SEASONAL DISTRIBUTION	L					X				JULY
		A	X	X	X				X		APRIL - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I				X						
	REGION II		X								
	REGION III		X								
	REGION IV		X	X							
	REGION V		X								
	REGION VI		X								
	REGION VII		X				X		X		
	REGION VIII		X								
	REGION IX										
	REGION X										

STATES AND PROVINCES MENTIONED: FL, GA, IL, IA, KY, ME, MO, MT, NY, N.W. TERR., NE, OK, ONT., PA, TN, TX

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M3 HCO_3 560 - 8100; SO_4 70 - 340; Cl LESS THAN 10 - 300; N 9.2 - 9.8; P LESS THAN 0.05 - 3.4; Si 31 - 270; Ca 170 - 2200; Mg 70 - 790; Na 10 - 500; K 10 - 60; O_2 40 - 370

(3) SPEC. COND. 784 - 795; TOT. COLIFORMS 2900 - 4300/100 ML; FECAL COLIFORMS 700 - 1900/100 ML; FECAL STREPTOCOCCI 12 - 68/100 ML; TOT. SOLIDS 440 - 526; SUSP. SOLIDS 74 - 123; Ca 65 - 68; K 5.3; Na 64 - 66; Cl 13.5 - 15.0; F 0.47 - 0.48; SO_4 249 - 270; ORG. N 0.52 - 0.59; SiO_2 7.3 - 7.7; BOD 1.0 - 2.3; COD 13 - 18; CYANIDE LESS THAN 0.005; PHENOLS LESS THAN 0.001; TOT. Cl LESS THAN 0.01; Cd 0.00005 - 0.00014; Cu 0.0029 - 0.0052; Fe 0.61 - 0.92; Pb 0.002 - 0.005; Mn 0.10 - 0.17; Hg 0.00005 - 0.00064; Zn 0.0077 - 0.013

(261) LIGHT TRAP AT LOCK 19 MISSISSIPPI RIVER WHERE IT COMPOSED LESS THAN 0.5% OF TOTAL

(234) WAS FOUND ABOVE BUT NOT BELOW STUDY RESERVOIR

Hydroptilidae *Ochrotrichia arva* (Ross)

	SOURCE	210	135	167																			NOTES OR RANGES
	PARAMETERS																						
	LARVAE																						
	ADULT	X	X	X																			
GENERAL HABITAT	LAKE/POND																						
	RIVER			X																			
	STREAM																						
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																						
	ALKALIPHILOUS >=7.0			X																			7.0 - 8.2
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.			X																			87 - 130
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL			X																			30 - 120
	NITRATES																						
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL																						
	SEASONAL L																						
	DISTRIBUTION A																						
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV	X	X																				
	REGION V			X																			
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: OH, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 8.5; TOT. HARDNESS as $CaCO_3$ 110 - 240; TOT. COLIFORMS 2 - 3/100 ML; Cl 35 - 120; MEAN WIDTH 4 - 7 METERS

Hydroptilidae *Ochrotrichia spinosa* (Ross)

	SOURCE		210	35	41	167	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X		X		
	ADULT		X			X	
GENERAL HABITAT	LAKE/POND						
	RIVER				X	X	
	STREAM						
	SPRING		X				
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER		X				
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					0.2 - 21
	MESOTHERMAL	15-30C			X		
	OLIGOTHERMAL	<15C			X		
	STENOTHERMAL	<5C			X		
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0			X	X	7.0
	ALKALIBIONTIC	>8.5			X		8.8
DO	DISS. OXYGEN	% SAT.				X	89 - 115
		MG/L			X		SEE COMMENTS
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL				X	40 - 123
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL	L					
	DISTRIBUTION	A					
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV		X	X			
	REGION V		X	X		X	
	REGION VI		X	X			
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, KY, N.W. TERR., OH, OK, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MOLES/M^3 O_2 0.0 - 0.38; Ca 0.54 - 3.8; Mg 0.26 - 2.1; Na 0.16 - 5.2; K 0.01 - 0.09; SO_4 0.27 - 2.2; Cl < 0.01 - 0.26; HCO_3 0.88 - 5.2; MILLIMOLES/M^3 N 10 - 74; P <0.05 - 1.1; Si 35 - 130; Fe 0.20 - 16; Mn <0.10 - 1.7; Zn 0.02 - 0.40; Cu 0.03 - 0.47; Pb < 0.01 - 0.02; Cd <0.01 - 0.01; SUSP. SED. < 0.20 - 35 G/M^3

(167) FREE CO_2 2.0 - 8.0; Cl 30 - 70; TOT. COLIFORMS 323/100 ML

Hydroptilidae *Ochrotrichia tarsalis* (Hagen)

	SOURCE / PARAMETERS		210	30	35	174	183	261	245	NOTES OR RANGES
	LARVAE		X			X				
	ADULT		X	X	X		X	X	X	
GENERAL HABITAT	LAKE/POND									
	RIVER					X		X		
	STREAM		X							
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON								
	EMBENTHIC	IN								
	EPILITHIC	ROCK								
	EPIPHYTIC	PLANT								
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER		X							
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY					X				25 - 405
	CURRENT									
TEMP.	EUTHERMAL	>30C				X				5 - 30.2
	MESOTHERMAL	15-30C				X				
	OLIGOTHERMAL	<15C				X				
	STENOTHERMAL	<5C								
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0								
	ALKALIPHILOUS	>=7.0				X				7.1
	ALKALIBIONTIC	>8.5				X				8.8
DO	DISS. OXYGEN	% SAT.								
		MG/L				X				3.7 - 12.3
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL				X				35 - 76
	NITRATES									
	NITRITES									
	AMMONIA									
	PHOSPHORUS	ORTHO								
		TOTAL								
	SEASONAL	L				X				NOVEMBER
	DISTRIBUTION	A		X				X		MARCH - DECEMBER
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II		X		X		X			
	REGION III									
	REGION IV			X	X					
	REGION V		X		X	X				
	REGION VI		X		X				X	
	REGION VII		X		X			X		
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: AR, FL, IA, IL, IN, MN, MO, NY, OK, ONT., TX, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (174) TOT. DISS. SOLIDS 320
(261) LIGHT TRAP COLLECTION AT LOCK 19 MISSISSIPPI RIVER, COMPOSED <0.5% OF TOTAL

Hydroptilidae ***Ochrotrichia unio*** **(Ross)**

	SOURCE PARAMETERS	210	188	237	167	NOTES OR RANGES
	LARVAE	X	X	X		
	ADULT	X				
GENERAL HABITAT	LAKE/POND					
	RIVER				X	
	STREAM	X	X	X		
	SPRING			X		
	TEMP. WATERS	X				
SPECIFIC HABITAT	EPIBENTHIC ON			X		
	EMBENTHIC IN					
	EPILITHIC ROCK			X		
	EPIPHYTIC PLANT			X		
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C					
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0		X	X	X	7.0 - 8.5
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.		X		X	90 - 160
	MG/L			X		8.5 - 10.6
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL			X	X	26.7 - 117
	NITRATES			X		0.8 - 1.8
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL					
	SEASONAL L		X	X		MARCH - OCTOBER
	DISTRIBUTION A					
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV		X	X		
	REGION V	X			X	
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: IL, KY, OH, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (237, 167) FREE CO_2 0.0 - 8.5; Ca HARDNESS 51 - 68; TOT. HARDNESS 68 - 240; Cl 35 - 75; TOT. COLIFORMS 3/100 ML

(188) ASSOCIATED WITH FOLLOWING ALGAE: *Lemanea, Cladophora, Stigeoclonium, Phormidium, Spirogyra*

(210) LARVAE OCCUR IN LARGE COLONIES

Hyroptilidae *Orthotrichia americana* Banks

	SOURCE / PARAMETERS	20	30	36	32	39	65	245	NOTES OR RANGES
	LARVAE	X							
	ADULT	X	X	X		X	X		
GENERAL HABITAT	LAKE/POND	X				X			
	RIVER								
	STREAM								
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER	X							
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT								
TEMP.	EUTHERMAL >30C								21.5 - 25.5
	MESOTHERMAL 15-30C					X			
	OLIGOTHERMAL <15C								
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0					X			6.9
	ALKALIPHILOUS >=7.0					X			
	ALKALIBIONTIC >8.5					X			9.2
DO	DISS. OXYGEN % SAT.								
	MG/L					X			0.1 - 11 ?
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL								
	NITRATES					X			0.39
	NITRITES					X			0
	AMMONIA					X			0.015 - 0.555
	PHOSPHORUS ORTHO					X			0 - 0.036
	TOTAL					X			0 - 0.663
	SEASONAL L								
	DISTRIBUTION A	X	X	X		X	X		FEB.- NOV.
GEOGRAPHIC DISTRIBUTION	REGION I			X	X				
	REGION II	X					X		
	REGION III	X					X		
	REGION IV	X	X				X		
	REGION V	X					X		
	REGION VI	X					X	X	
	REGION VII					X	X		
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, D.C. FL, GA, IL, KY, MA, ME, MO, MN, NH, NY, TX, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (39) SECCHI DISK 0.7 - 1.5 M

Hydroptilidae *Oxyethira pallida* (Banks)

	SOURCE PARAMETERS	20	30	36	32	39	167																NOTES OR RANGES
	LARVAE						X																
	ADULT	X	X	X	X	X																	
GENERAL HABITAT	LAKE/POND	X				X																	
	RIVER						X																
	STREAM	X																					
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						18.5 - 26.5
	MESOTHERMAL 15-30C					X																	
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0					X																	6.9
	ALKALIPHILOUS >=7.0					X	X																
	ALKALIBIONTIC >8.5					X																	9.4
DO	DISS. OXYGEN % SAT.						X																79 - 125
	MG/L					X																	0.1 - 17.3 ?
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL						X																30 - 115
	NITRATES					X																	0 - 39
	NITRITES					X																	0
	AMMONIA					X																	0 - 0.246
	PHOSPHORUS ORTHO					X																	0 - 0.036
	TOTAL					X																	0 - 0.663
	SEASONAL L																						
	DISTRIBUTION A	X	X	X		X																	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I			X	X																		
	REGION II	X																					
	REGION III	X																					
	REGION IV		X																				
	REGION V	X					X																
	REGION VI	X																					
	REGION VII	X				X																	
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: D.C., FL, IL, ME, MO, NH, NE, NY, OH, OK, TX, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (39) SECCHI DISK 0.7 - 1.5 M (167) FREE CO_2 0.0 - 8.0; HARDNESS as $CaCO_3$ 110 - 250; TOT. COLIFORMS 1/100 ML; Cl 40 - 135

Hydroptilidae *Palaeagapetus celsus* (Ross)

	SOURCE	210	164	275	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X	X	
	ADULT	X	X		
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM		X		
	SPRING			X	
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				SILKEN, COVERED WITH LIVERWORT
	CASE MAKER			X	
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL >30C				COLD
	MESOTHERMAL 15-30C				
	OLIGOTHERMAL <15C			X	
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0		X		6.9
	ALKALIPHILOUS >=7.0				
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL				
	NITRATES			X	0.007 MEQ/L
	NITRITES				
	AMMONIA			X	0.004 MEQ/L
	PHOSPHORUS ORTHO			X	<0.001 MEQ/L
	TOTAL				
	SEASONAL L			X	MAY
	DISTRIBUTION A		X		
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV	X		X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: NC, NEW BRUNS., TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.95; REST MEQ/L HCO_3 0.187; Na 0.054; Ca 0.209; K 0.008; Mg 0.056; SO_4 0.053; Cl 0.024

LEPIDOSTOMATIDAE

There are two genera and approximately 70 species of this family in North America. Currently there are no keys to the larvae for this portable case making family, although the larvae for nearly a dozen species have been described. The larvae are restricted to lotic habitats and often have a very localized distribution.

1. Genus *Lepidostoma* Rambur

There are approximately 65 species of this widespread genus in North America. We include profiles for only six. Most *Lepidostoma* are restricted to shaded springs and small streams where they feed on detritus, although they are also reported feeding on dead fish. Typically their case is four-sided and constructed of squares of leaf matter, though several species have sand or stick cases.

2. Genus *Theliopsyche* Banks

Only five eastern species of this genus are known and the larvae has been described for only one, *T. melas* Edwards. We include a very limited profile for this species. Populations of this genus seem to be restricted to sand or gravel beds in springs or small streams. They make their case entirely out of sand.

Lepidostomatidae *Lepidostoma frosti* Milne

	SOURCE PARAMETERS	154	76	107																			NOTES OR RANGES
	LARVAE			X																			
	ADULT	X	X	X																			
GENERAL HABITAT	LAKE/POND																						
	RIVER																						
	STREAM	X		X																			
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0	X																					6.8 - 6.9
	ALKALIPHILOUS >=7.0																						
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL																						
	NITRATES	X																					
	NITRITES																						0.007 MEQ/L
	AMMONIA	X																					0.004 MEQ/L
	PHOSPHORUS ORTHO	X																					<0.001 MEQ/L
	TOTAL																						
	SEASONAL L																						
	DISTRIBUTION A	X	X	X																			JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X																			
	REGION II																						
	REGION III																						
	REGION IV			X																			
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: ME, MA, NC, NH, NEW BRUNS., NOVA SCOTIA, QUE., TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SEDIMENT 0.78 - 0.95; REST IN MEQ/L Na 0.054; K 0.008; Ca 0.209; Mg 0.056; HCO_3 0.187; SO_4 0.052; Cl 0.024

Lepidostomatidae *Lepidostoma griseum* (Banks)

	SOURCE / PARAMETERS		154	1107	1135	275	NOTES OR RANGES
	LARVAE		X	X		X	
	ADULT			X	X		
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM		X	X	X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER					X	BARK OR LEAF PIECES
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY				X		0.5 - 1.8
	CURRENT						
TEMP.	EUTHERMAL	>30C					0 - 26
	MESOTHERMAL	15-30C			X		
	OLIGOTHERMAL	<15C			X		
	STENOTHERMAL	<5C			X		
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0	X		X		5.9 - 6.8
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.			X		66 - 95
		MG/L			X		6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL			X		3.7 - 6.7
	NITRATES		X		X		SEE COMMENTS
	NITRITES				X		SEE COMMENTS
	AMMONIA		X				0.003 MEQ/L
	PHOSPHORUS	ORTHO	X		X		SEE COMMENTS
		TOTAL					
	SEASONAL	L	X	X			JULY - AUGUST
	DISTRIBUTION	A		X			AUGUST - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I			X			
	REGION II			X			
	REGION III			X			
	REGION IV			X			
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: GA, ME, MA, MI, NH, NJ, NY, NC, NEW BRUNS., ONT., PA, QUE., TN, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.78; REST IN MEQ/L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; HCO_3 0.235; SO_4 0.052; NO_3 0.007; H_2PO_4 <0.001 (135) TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; PO_4 0.01 - 0.15; TOT. ORG. C 4 - 20; SPEC. COND. 17 - 40; NO_2 + NO_3 0 - 0.01

Lepidostomatidae *Lepidostoma ontario* Ross

	SOURCE / PARAMETERS		76	135	NOTES OR RANGES
	LARVAE				
	ADULT		X	X	
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	0.5 - 1.8
	CURRENT				
TEMP.	EUTHERMAL	>30C			0 - 26
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C		X	
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0		X	5.9 - 6.8
	ALKALIPHILOUS	>=7.0			
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.		X	66 - 95
		MG/L		X	6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL		X	3.7 - 6.7
	NITRATES			X	SEE COMMENTS
	NITRITES			X	SEE COMMENTS
	AMMONIA				
	PHOSPHORUS	ORTHO		X	0.01 - 0.15
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A	X		JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X		
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: ME, NH, NOVA SCOTIA, ONT.; QUE.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (135) TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; TOT. ORG. C 4 - 20; SPEC. COND. 17 - 40 ; NO_2 + NO_3 0 - 0.1

Lepidostomatidae *Lepidostoma raymeri* Ross

	SOURCE	256	235	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X	X	
	ADULT			
GENERAL HABITAT	LAKE/POND			
	RIVER		X	
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	0.3 - 180 NTU
	CURRENT			
TEMP.	EUTHERMAL >30C			0.6 - 26
	MESOTHERMAL 15-30C		X	
	OLIGOTHERMAL <15C	X	X	
	STENOTHERMAL <5C		X	
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0		X	6.0
	ALKALIPHILOUS >=7.0	X	X	8.2
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.	X		ALWAYS > 100
	MG/L	X		10.1 (MEAN)
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL			
	NITRATES		X	<0.05 - 0.5
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO		X	<0.02 - 0.05
	TOTAL		X	0.02 - 0.86
	SEASONAL L			
	DISTRIBUTION A			
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII	X		
	REGION IX			
	REGION X		X	

STATES AND PROVINCES MENTIONED: CO, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.06; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10

Lepidostomatidae *Lepidostoma swannanoa* Ross

	SOURCE PARAMETERS	154	76	265	135	NOTES OR RANGES
	LARVAE					
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	0.5 - 1.8
	CURRENT					
TEMP.	EUTHERMAL >30C					0 - 26
	MESOTHERMAL 15-30C				X	
	OLIGOTHERMAL <15C				X	
	STENOTHERMAL <5C				X	
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0	X			X	5.9 - 6.8
	ALKALIPHILOUS >=7.0					
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.				X	66 - 95
	MG/L				X	6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL				X	3.7 - 6.7
	NITRATES	X			X	SEE COMMENTS
	NITRITES				X	SEE COMMENTS
	AMMONIA	X				0.003 MEQ/L
	PHOSPHORUS ORTHO	X			X	SEE COMMENTS
	TOTAL					
	SEASONAL L					
	DISTRIBUTION A		X	X		JUNE
GEOGRAPHIC DISTRIBUTION	REGION I		X			
	REGION II		X			
	REGION III					
	REGION IV		X			
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: MA, NC, NY, NH, NEW BRUNS., NEW FOUND., QUE.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.78; REST IN MEQ/L Na 0.049; K 0.008; Ca 0.235; Mg 0.072; NO_3 0.007 HCO_3 0.235; SO_4 0.052; Cl 0.025; H_2PO_4 0.001

(135) TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; PO_4 0.01 - 0.15; TOT. ORG. C 4 - 20; $NO_2 + NO_3$ 0 - 0.1; SPEC. COND. 17 - 40

Lepidostomatidae *Lepidostoma unicolor* (Banks)

	SOURCE PARAMETERS		5	6	76	235	9	282	NOTES OR RANGES
	LARVAE		X			X	X	X	
	ADULT		X	X	X			X	
GENERAL HABITAT	LAKE/POND							X	
	RIVER		X			X			
	STREAM			X					
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC	ON	X					X	
	EMBENTHIC	IN							
	EPILITHIC	ROCK							
	EPIPHYTIC	PLANT	X					X	
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER		X						
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE						X		
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY		X			X			0.2 - 3.6
	CURRENT		X						71 CM/S
TEMP.	EUTHERMAL	>30C							0.5 - 26
	MESOTHERMAL	15-30C				X			
	OLIGOTHERMAL	<15C	X	X		X	X		
	STENOTHERMAL	<5C				X			
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0							6.0
	ALKALIPHILOUS	>=7.0	X	X		X			8.2
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.							
		MG/L							
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL	X						53 - 58
	NITRATES		X			X			0.01 - 0.5
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO	X			X			<0.02 - 0.57
		TOTAL				X			0.02 - 0.86
	SEASONAL	L	X				X	X	JAN. - DEC.
	DISTRIBUTION	A	X	X	X				JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V				X				
	REGION VI								
	REGION VII								
	REGION VIII				X				
	REGION IX				X				
	REGION X		X	X	X	X	X		

STATES AND PROVINCES MENTIONED: BRIT. COL., MN, OR, SASK. FROM MINNESOTA TO PACIFIC COAST AND NORTH INTO SASK.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 235) TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca 5.4 - 18; Fe 0 - 0.71; Mg 1.4 - 7.1; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14; B 0 - 0.6

(135) TURBIDITY 0.3 - 180 NTU

Lepidostomatidae *Theliopsyche melas* Edwards

	SOURCE	275																					NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X																					
	ADULT																						
GENERAL HABITAT	LAKE/POND																						
	RIVER																						
	STREAM																						
	SPRING	X																					
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN	X																					
	EPILITHIC ROCK	X																					IN CLEAN GRAVEL BED
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER	X																					FINE ROCK FRAG.
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C																						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																						
	ALKALIPHILOUS >=7.0																						
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL																						
	NITRATES																						
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL																						
	SEASONAL L	X																					MAY
	DISTRIBUTION A																						
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV	X																					
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

LEPTOCERIDAE

This family is one of the larger caddisfly families with seven known North American genera and just over 100 species. The adults are known for their extremely long, slender antennae. The larvae inhabit diverse lentic and lotic habitats, feed on a variety of foods, and construct portable long, narrow cases of silk, sand, plant or animal materials.

1. Genus Ceraclea Stephens

This is the largest North American leptocerid genus with approximately 34 species known north of Mexico. The larvae construct silk and/or silk and sand cases. Several species are associated with freshwater sponges. Larvae inhabit lentic and lotic environments and feed on a variety of foods. Although there are wide differences in environmental requirements for members of this genus, each species has distinctive requirements that often fall within a narrow range. We have water quality profiles for only three Ceraclea species.

2. Genus Leptocerus Leach

This lentic genus has only one species known from the United States. Leptocerus americanus (Banks) is an eastern pond and lake species. The case is long and slender constructed entirely of silk. The larvae are strong swimmers and are found on submerged aquatic plants.

3. Genus Mystacides Berthold

Three species, two northern and one western, occur in the United States. Larvae occur in the slower waters of rivers, ponds and in lakes. We include a water quality profile for M. sepulchralis (Walker). The cases of the larvae of this genus are unique among the leptocerids being a straight tube covered with miscellaneous rocks and/or plant material and several anteriorly projecting twigs or needles.

4. Genus Nectopsyche Müller

Twelve species of this lentic genus are known from the United States with eleven of the larvae described. Elongate tubular cases are constructed with plant material, mineral, or diatoms, and are often strengthened with a single twig or needle which projects beyond the anterior end. We include profiles for seven species.

5. Genus *Oecetis* McLachlan

There are approximately 20 species of this widespread genus in the United States. Diagnostic characters are known for only five species and we include profiles for two of these. Like other leptocerids, the larvae are found primarily in slow moving waters or lentic habitats. This genus is often quite abundant and is apparently primarily a predator. Members of this genus have a long, curved tubular case.

6. Genus *Setodes* Rambur

Six eastern species of this genus are known from North America, although only one species, *S. incerta* (Walk.), is associated. We have no water data available for members of this genus which are collected from mostly lotic environments. The larvae have a tube-like case made of rock fragments which is open on both ends. Apparently the larvae can burrow into the substrate and conceal all but the anterior end.

7. Genus *Triaenodes* McLachlan

The larvae of this genus occur mostly in the eastern half of North America with about 25 species known. The larvae are always associated with aquatic vascular plants from which they construct a case of spirally arranged leaf fragments. Some members of this genus appear to be tolerant of high water temperatures and high pH. We have a profile for only one species, *Triaenodes tarda* Milne.

Leptoceridae *Ceraclea ancylus* (Vorhies)

	SOURCE	210	14	193	183	245	204	NOTES OR RANGES
	PARAMETERS							
	LARVAE	X	X				X	
	ADULT	X		X	X	X		
GENERAL HABITAT	LAKE/POND	X						
	RIVER		X			X		
	STREAM	X				X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON	X						
	EMBENTHIC IN							
	EPILITHIC ROCK	X						
	EPIPHYTIC PLANT	X						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER	X						
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY							
	CURRENT							
TEMP.	EUTHERMAL >30C							23.5
	MESOTHERMAL 15-30C		X					
	OLIGOTHERMAL <15C							
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0		X					7.9
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.							
	MG/L							
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL		X					22
	NITRATES		X					SEE COMMENTS
	NITRITES		X					SEE COMMENTS
	AMMONIA		X					0.02
	PHOSPHORUS ORTHO							
	TOTAL		X					0.04
SEASONAL DISTRIBUTION	L		X					SEPTEMBER
	A	X				X		APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II	X			X			
	REGION III							
	REGION IV	X	X					
	REGION V	X						
	REGION VI	X				X		
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: AR, GA, IL, NY, NC, OH, OK, SASK., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (14) SPEC. COND. 63; BOD 0.3; Fe 0.85; Mn 0.05; $NO_2 + NO_3$ 0.28; FECAL COLIFORMS 750/100 ML

(204) COMMON IN SMALL TO MODERATE SIZED STREAMS. MORE TOLERANT OF POLLUTION THAN *A. erraticus*, *erullus*, *menteius*, AND *saccus*.

(210) COLLECTED IN WIDE EXTREMES OF ENVIRONMENT

Leptoceridae *Ceraclea flava* (Banks)

	SOURCE	13	261	204	141	210	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X			X	X	
	ADULT		X			X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X	X	X	X	X	
	STREAM			X			
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER				X		SAND
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY	X					<25 UNITS
	CURRENT				X		0.40 - 0.48 FT/S
TEMP.	EUTHERMAL >30C						13 - 21
	MESOTHERMAL 15-30C	X					
	OLIGOTHERMAL <15C	X					
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0	X					8.1 - 8.2
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.	X					84 - 100
	MG/L	X					6.8 - 9.0
H_2O CHEMISTRY	ALKALINITY PHTH.	X					0
	TOTAL	X					124 - 138
	NITRATES	X					0.2
	NITRITES	X					0.000
	AMMONIA	X					0.40 - 0.70
	PHOSPHORUS ORTHO	X					0.0
	TOTAL						
	SEASONAL DISTRIBUTION L	X			X	X	MAY - OCTOBER
	A		X			X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III					X	
	REGION IV					X	
	REGION V			X	X	X	
	REGION VI						
	REGION VII	X	X				
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: MO, IA, IL, WI, KY, PA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (13) SPEC. COND. 225 - 260; COLIFORMS 80/100 ML; TOT. HARDNESS 127 - 144; Ca as $CaCO_3$ 72 - 80; Mg as $CaCO_3$ 47 - 72; Si as SiO_2 2.6; Fe 0.04; Mn 0.01; Na 3.6; K 2.9; SO_4 23; Cl 3.0; Fl 0.2; DETERGENTS as ABS 0.0

(261) CAUGHT IN LIGHT TRAP LOCK 19 MISSISSIPPI R. COMPOSED LESS THAN 0.5% OF TOTAL.

(204) COMMON IN SMALL TO MODERATE SIZED STREAMS.

Leptoceridae *Ceraclea tarsipunctatus* (Vorhies)

	SOURCE / PARAMETERS		148	174	193	234	167	183	245	203	204	NOTES OR RANGES
	LARVAE		X	X						X	X	
	ADULT				X		X	X	X			
GENERAL HABITAT	LAKE/POND										X	
	RIVER		X	X		X			X	X		
	STREAM								X			
	SPRING											
	TEMP. WATERS											
SPECIFIC HABITAT	EPIBENTHIC	ON										
	EMBENTHIC	IN										
	EPILITHIC	ROCK										
	EPIPHYTIC	PLANT										
	OTHER											
HOME	RETREAT BUILDER											
	CASE MAKER											
	FREELIVING											
DIET	CARNIVORE											
	HERBIVORE											
	OMNIVORE											
	DETRITIVORE											
	TURBIDITY		X	X								6.0 - 330
	CURRENT											
TEMP.	EUTHERMAL	>30C										14 - 23.8
	MESOTHERMAL	15-30C		X								
	OLIGOTHERMAL	<15C	X									
	STENOTHERMAL	<5C										
PH	ACIDOBIONTIC	<5.5										
	ACIDOPHILIC	<7.0										
	ALKALIPHILOUS	>=7.0	X	X								7.5 - 8.2
	ALKALIBIONTIC	>8.5										
DO	DISS. OXYGEN	% SAT.										
		MG/L	X	X								5.5 - 10.0
H_2O CHEMISTRY	ALKALINITY	PHTH.										
		TOTAL	X	X								38 - 121
	NITRATES											
	NITRITES											
	AMMONIA											
	PHOSPHORUS	ORTHO										
		TOTAL										
	SEASONAL	L	X	X								SEPTEMBER
	DISTRIBUTION	A							X			MARCH - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I											
	REGION II							X				
	REGION III											
	REGION IV		X	X			X				X	
	REGION V								X			
	REGION VI											
	REGION VII											
	REGION VIII											
	REGION IX											
	REGION X											

STATES AND PROVINCES MENTIONED: IN, MI, NY, OH, ONT., SASK.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (148) HARDNESS as $CaCO_3$ 159

Leptoceridae *Leptocerus americanus* (Banks)

	SOURCE / PARAMETERS	210	40	137	195	167	245	275	NOTES OR RANGES
	LARVAE	X	X	X				X	
	ADULT	X				X	X		
GENERAL HABITAT	LAKE/POND	X			X				GLACIAL (210)
	RIVER		X	X					
	STREAM	X							
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON	X							
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT	X			X				
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER	X						X	
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT	X							SLOW
TEMP.	EUTHERMAL >30C								1 - 22.1 (137)
	MESOTHERMAL 15-30C		X	X					
	OLIGOTHERMAL <15C			X					
	STENOTHERMAL <5C			X					
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0			X					6.49 (137)
	ALKALIPHILOUS >=7.0		X	X					8.0 (40)
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L		X	X					4.7 - 11.8 (137)
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL		X	X					18.0 - 80
	NITRATES		X						0.04
	NITRITES		X						0.01
	AMMONIA		X						0.03
	PHOSPHORUS ORTHO								
	TOTAL		X						0.03
	SEASONAL DISTRIBUTION L	X	X	X				X	FEB. - SEPT.
	A	X				X	X		MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I							X	
	REGION II			X	X			X	
	REGION III		X					X	
	REGION IV							X	
	REGION V	X				X		X	
	REGION VI						X	X	
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: IL, NY, OH, AR, MN to ME, south to TN & TX

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (40, 137) SPEC. COND. 215; BOD 0.6; HARDNESS 120 ; Ca 24.0; Mg 15.0; Cl 18.0; SECCHI DISK 3.0 - BOTTOM (6.0) METERS

(210) SWIM RAPIDLY THROUGH LENTIC WATERS; ASSOCIATED WITH *CERATOPHYLLUM* BEDS

Leptoceridae *Mystacides sepulchralis* (Walker)

	SOURCE / PARAMETERS	41	193	285	245	275	114	141	135	210	NOTES OR RANGES
	LARVAE	X		X		X	X	X		X	
	ADULT		X	X	X			X	X	X	
GENERAL HABITAT	LAKE/POND			X		X			X		
	RIVER	X		X		X	X	X			
	STREAM			X	X						
	SPRING										
	TEMP. WATERS										
SPECIFIC HABITAT	EPIBENTHIC ON							X			
	EMBENTHIC IN										
	EPILITHIC ROCK							X			
	EPIPHYTIC PLANT										
	OTHER							X			SAND
HOME	RETREAT BUILDER										
	CASE MAKER										
	FREELIVING										
DIET	CARNIVORE										
	HERBIVORE										
	OMNIVORE					X					
	DETRITIVORE										
	TURBIDITY						X				1.1 - 6.3 FTU
	CURRENT							X			0.05 - 2.29 FT/S
TEMP.	EUTHERMAL >30C										0.2 - 21
	MESOTHERMAL 15-30C	X					X				
	OLIGOTHERMAL <15C	X					X				
	STENOTHERMAL <5C	X									
PH	ACIDOBIONTIC <5.5										
	ACIDOPHILIC <7.0						X				6.5
	ALKALIPHILOUS >=7.0	X					X				
	ALKALIBIONTIC >8.5	X									8.8
DO	DISS. OXYGEN % SAT.						X				94 - 105
	MG/L						X				10.4 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.										
	TOTAL						X				8.9 - 12.2
	NITRATES						X				0.01 - 0.05
	NITRITES										
	AMMONIA						X				0 - 0.2
	PHOSPHORUS ORTHO										
	TOTAL						X				0.05 - 0.16
	SEASONAL L			X						X	MAY - JUNE
	DISTRIBUTION A			X	X					X	MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			X			X				
	REGION II			X							
	REGION III			X							
	REGION IV			X							
	REGION V			X				X			
	REGION VI			X	X						
	REGION VII			X							
	REGION VIII			X							
	REGION IX			X							
	REGION X			X							

STATES AND PROVINCES MENTIONED: AK, ALBERTA, AR, BRIT. COL., CA, CT, GA, IL, IN, ME, MANITOBA, MA, MI, MN, MS, MT, NEW BRUNS., NEWFOUNDLAND, NH, NJ, NY, NOVA SCOTIA, OH, ONT., PA, QUEBEC, SD, TN, VT, VA, WV, WI, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) IN MOLES/M^3 Ca 0.54 - 3.8; Mg 0.26 - 2.1; Na 0.16 - 5.2; K 0.01 - 0.09; SO_4 0.27 - 2.2; Cl 0.01 - 0.26; HCO_3 0.88 - 5.2; OTHERS IN MILLIMOLES/M^3 N 10 - 74; P 0.05 - 1.1; Si 35 - 130; Fe 0.20 - 16; Mn 0.10 - 1.7; Zn 0.02 - 0.40; Cu 0.03 - 0.47; Pb 0.01 - 0.02; Cd 0.01

(114) HARDNESS as $CaCO_3$ 11.7 - 19.8; SULFATE 6 - 10; Cl 3.9 - 4.9; TOT. Fe 0.03 - 0.20; COND. 44 - 60

(275) SLOW MOVING RIVERS AND LAKES

(135) COLLECTED IN LAKES WITH AND WITHOUT SUMMER DEFICIT OF O_2

Leptoceridae *Nectopsyche candida* (Hagen)

	SOURCE		210	3	146	193	234	167	245	288	NOTES OR RANGES
	PARAMETERS										
	LARVAE		X	X			X			X	
	ADULT		X			X		X	X	X	
GENERAL HABITAT	LAKE/POND		X								
	RIVER		X	X			X				
	STREAM		X								
	SPRING										
	TEMP. WATERS										
SPECIFIC HABITAT	EPIBENTHIC	ON	X								
	EMBENTHIC	IN									
	EPILITHIC	ROCK	X								
	EPIPHYTIC	PLANT	X								
	OTHER										
HOME	RETREAT BUILDER										
	CASE MAKER		X								
	FREELIVING										
DIET	CARNIVORE										
	HERBIVORE										
	OMNIVORE										
	DETRITIVORE										
	TURBIDITY										
	CURRENT										
TEMP.	EUTHERMAL	>30C		X							
	MESOTHERMAL	15-30C		X							
	OLIGOTHERMAL	<15C		X							
	STENOTHERMAL	<5C									
PH	ACIDOBIONTIC	<5.5									
	ACIDOPHILIC	<7.0									
	ALKALIPHILOUS	>=7.0		X							
	ALKALIBIONTIC	>8.5									
DO	DISS. OXYGEN	% SAT.									
		MG/L									
H_2O CHEMISTRY	ALKALINITY	PHTH.									
		TOTAL									
	NITRATES				X						0.35
	NITRITES										
	AMMONIA				X						<0.10
	PHOSPHORUS	ORTHO			X						0.10
		TOTAL			X						0.12
	SEASONAL	L		X						X	APRIL - OCTOBER
	DISTRIBUTION	A	X						X	X	MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I									X	
	REGION II		X							X	
	REGION III		X								
	REGION IV		X								
	REGION V		X					X		X	
	REGION VI								X		
	REGION VII		X	X	X					X	
	REGION VIII										
	REGION IX										
	REGION X										

STATES AND PROVINCES TIONED: AR, FL, IL, IN, IA, KY, MA, MI, MN, MO, NY, NJ, NE, NEW BRUNS., OH, ONT., PA, QUE., SASK., VT, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (234) FOUND BELOW RESERVOIR IN STUDY (288) NORTHERN COOL WATER SPECIES

Leptoceridae *Nectopsyche diarina* Ross

	SOURCE	210	288	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X	X	
	ADULT	X	X	
GENERAL HABITAT	LAKE/POND			
	RIVER		X	
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON		X	
	EMBENTHIC IN			
	EPILITHIC ROCK		X	
	EPIPHYTIC PLANT			
	OTHER		X	SAND
HOME	RETREAT BUILDER			
	CASE MAKER	X	X	
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE		X	
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	
	CURRENT		X	
TEMP.	EUTHERMAL >30C			
	MESOTHERMAL 15-30C	X		
	OLIGOTHERMAL <15C		X	
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0			
	ALKALIBIONTIC >8.5		X	
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL		X	>100
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO			
	TOTAL			
	SEASONAL L		X	MAY - SEPTEMBER
	DISTRIBUTION A	X	X	JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II		X	
	REGION III			
	REGION IV			
	REGION V	X	X	
	REGION VI			
	REGION VII		X	
	REGION VIII	X	X	
	REGION IX			
	REGION X		X	

STATES AND PROVINCES MENTIONED: IL, IN, ID, KS, MI, MN, NE, NY, ND, ONT., SD, SASK., OH, UT, WI, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (288) FEELS RESTRICTED TO COOLER STREAMS, LAKES ACROSS NORTHERN UNITED STATES AND CANADA

Leptoceridae *Nectopsyche dorsalis* Banks

	SOURCE		288	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER			
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON	X	
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER		X	SAND
HOME	RETREAT BUILDER			
	CASE MAKER		X	
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE		X	
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	
	CURRENT		X	
TEMP.	EUTHERMAL	>30C	X	UP TO 38° C
	MESOTHERMAL	15-30C	X	
	OLIGOTHERMAL	<15C		
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5	X	
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L	X	JUNE
	DISTRIBUTION	A	X	MARCH - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX		X	
	REGION X			

STATES AND PROVINCES MENTIONED: AZ, CA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (288) RESTRICTED TO WARMER WATERS

Leptoceridae *Nectopsyche exquisita* (Walker)

	SOURCE		210	146	245	288	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X			X	
	ADULT		X		X		
GENERAL HABITAT	LAKE/POND		X				
	RIVER				X	X	
	STREAM				X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER		X			X	
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L					
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES			X			0.35
	NITRITES						
	AMMONIA			X			<0.10
	PHOSPHORUS	ORTHO		X			0.10
		TOTAL		X			0.12
	SEASONAL	L				X	MARCH - AUGUST
	DISTRIBUTION	A	X		X	X	MARCH - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I		X			X	
	REGION II		X			X	
	REGION III		X			X	
	REGION IV		X			X	
	REGION V		X			X	
	REGION VI		X		X	X	
	REGION VII		X	X		X	
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, FL, GA, IL, IN, KY, MD, ME, MI, MO, MN, MANIT., NE, NH, NY, NC, OH, OK, ONT., PA, QUE., SC, TN, VT, WI, NEW BRUNS., NOVA SCOTIA

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Leptoceridae *Nectopsyche gracilis* (Banks)

	SOURCE		288	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER		X	
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON	X	
	EMBENTHIC	IN		
	EPILITHIC	ROCK	X	
	EPIPHYTIC	PLANT		
	OTHER		X	SAND
HOME	RETREAT BUILDER			
	CASE MAKER		X	
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE		X	
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	
	CURRENT		X	
TEMP.	EUTHERMAL	>30C		
	MESOTHERMAL	15-30C	X	
	OLIGOTHERMAL	<15C		
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0	X	
	ALKALIBIONTIC	>8.5	X	
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL	X	>100
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L	X	JAN. - NOV.
	DISTRIBUTION	A	X	MARCH - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI		X	
	REGION VII			
	REGION VIII		X	
	REGION IX		X	
	REGION X		X	

STATES AND PROVINCES MENTIONED: AZ, CA, NM, OR, TX, UT, WA, SASK.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (288) THE PREDOMINATE WEST COAST SPECIES. INVADES SOME CANALS AND FEEDS ON *Salix* ROOTLETS.

Leptoceridae *Nectopsyche minuta* Banks

	SOURCE	288	NOTES OR RANGES
	PARAMETERS		
	LARVAE	X	
	ADULT	X	
GENERAL HABITAT	LAKE/POND		
	RIVER	X	
	STREAM		
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON		
	EMBENTHIC IN		
	EPILITHIC ROCK		
	EPIPHYTIC PLANT		
	OTHER	X	MUD, SAND
HOME	RETREAT BUILDER		
	CASE MAKER	X	
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE	X	
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY	X	
	CURRENT		
TEMP.	EUTHERMAL >30C		
	MESOTHERMAL 15-30C	X	
	OLIGOTHERMAL <15C		
	STENOTHERMAL <5C		
PH	ACIDOBIONTIC <5.5		
	ACIDOPHILIC <7.0		
	ALKALIPHILOUS >=7.0		
	ALKALIBIONTIC >8.5	X	
DO	DISS. OXYGEN % SAT.		
	MG/L		
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL		
	NITRATES		
	NITRITES		
	AMMONIA		
	PHOSPHORUS ORTHO		
	TOTAL		
	SEASONAL L	X	JULY
	DISTRIBUTION A	X	JULY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II		
	REGION III		
	REGION IV		
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX	X	
	REGION X	X	

STATES AND PROVINCES MENTIONED: CA, NV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (288) PROBABLY CONFINED TO GREAT BASIN. FOUND IN WARM, MUDDY WATERS, USUALLY WITH SAND SUBSTRATE.

Leptoceridae *Nectopsyche pavida* (Hagen)

	SOURCE / PARAMETERS	210	39	51	61	174	245	288	NOTES OR RANGES
	LARVAE	X		X	X			X	
	ADULT	X	X				X	X	
GENERAL HABITAT	LAKE/POND		X						
	RIVER			X	X	X	X		
	STREAM						X		
	SPRING							X	
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER	X						X	
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE							X	
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY			X		X			25 - 500
	CURRENT			X					0.22 - 1.56 FT/S
TEMP.	EUTHERMAL >30C								18.5 - 27
	MESOTHERMAL 15-30C		X	X	X				
	OLIGOTHERMAL <15C								
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0				X	X			6.7
	ALKALIPHILOUS >=7.0		X	X		X			8.4
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L		X	X	X	X			3.7 - 17.3
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL			X		X			29 - 163
	NITRATES		X		X				0.30 - 8
	NITRITES		X						0
	AMMONIA		X		X				0.015 - 0.19
	PHOSPHORUS ORTHO		X						0.009
	TOTAL		X		X				0 - 1.100
	SEASONAL DISTRIBUTION L	X		X	X			X	APRIL - SEPTEMBER
	A	X	X				X	X	MARCH - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I	X						X	
	REGION II	X						X	
	REGION III	X						X	
	REGION IV	X			X			X	
	REGION V	X				X		X	
	REGION VI	X					X	X	
	REGION VII	X	X	X					
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AR, D.C., FL, GA, IL, KY, MO, MA, MI, NY, OK, TN, WI, IN, MS, NH, NJ, OH, TX, VA, ONT.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (51, 61, 174) WATER TRANSPARENCY 21 - 38.5 CM; SETTLEABLE SOLIDS 0.1; TOT. SUSPENDED SOLIDS 5; TOT. SOLIDS 210; TOT. DISS. SOLIDS 142 - 397; SPEC. COND. 150; BOD 2.8; COD 71; FECAL COLIFORMS OVER 1000/100 ML; FECAL STREPTOCOCCI 300/100 ML; TOT. KJ. N 0.89; SO_4 4.0; Cl 24; Na 14.0; K 2.20; Mg 2.80; Ca 18.0; Cr LESS THAN 0.01; Mn 0.01; Fe 0.30; Ni LESS THAN 0.01; Cu 0.01; Zn 0.03; Cd LESS THAN 0.01; Hg LESS THAN 0.20; Al 0.4; Pb LESS THAN 0.10; Se LESS THAN 2.0; HARDNESS 59.0; CHLOROPHYLLS a 1.99; b 1.20; c 1.01; TOT. COUNT 200

	SOURCE	12	13	113	190	193	234	235	183	245	114	141	210	NOTES OR RANGES
	PARAMETERS													
	LARVAE	X	X	X							X	X	X	
	ADULT				X	X		X	X	X			X	
GENERAL HABITAT	LAKE/POND													
	RIVER	X	X	X	X		X	X		X	X	X		
	STREAM									X			X	
	SPRING													
	TEMP. WATERS													
SPECIFIC HABITAT	EPIBENTHIC ON													
	EMBENTHIC IN													
	EPILITHIC ROCK													
	EPIPHYTIC PLANT													
	OTHER													
HOME	RETREAT BUILDER													
	CASE MAKER												X	
	FREELIVING													
DIET	CARNIVORE													
	HERBIVORE													
	OMNIVORE													
	DETRITIVORE													
	TURBIDITY		X	X				X						SEE COMMENTS
	CURRENT											X		0.26 - 2.51 FT/S
TEMP.	EUTHERMAL >30C													2.6 - 28.5
	MESOTHERMAL 15-30C		X	X				X						
	OLIGOTHERMAL <15C			X				X			X			
	STENOTHERMAL <5C							X						
PH	ACIDOBIONTIC <5.5													
	ACIDOPHILIC <7.0			X				X			X			6.0
	ALKALIPHILOUS >=7.0		X					X						
	ALKALIBIONTIC >8.5		X											8.6
DO	DISS. OXYGEN % SAT.		X	X							X			67 - 122
	MG/L	X	X	X							X			6.0 - 11.5
H₂O CHEMISTRY	ALKALINITY PHTH.		X											0 - 8
	TOTAL		X	X							X			SEE BELOW
	NITRATES		X	X				X			X			0.01 - 0.5
	NITRITES		X	X										0.000 - 0.005
	AMMONIA		X	X							X			0.0 - 1.00
	PHOSPHORUS ORTHO		X					X						0.0 - 0.05
	TOTAL	X		X				X			X			0.02 - 0.86
	SEASONAL L	X	X	X									X	APRIL - OCTOBER
	DISTRIBUTION A				X					X			X	APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I	X		X							X		X	
	REGION II								X				X	
	REGION III												X	
	REGION IV												X	
	REGION V											X	X	
	REGION VI									X			X	
	REGION VII		X										X	
	REGION VIII				X								X	
	REGION IX													
	REGION X							X					X	

STATES AND PROVINCES MENTIONED: AL, AR, BRIT. COL., GA, ID, IL, IN, KY, ME, MD, MA, MI, MN, MO, MT, NM, NY, NOVA SCOTIA, OH, OK, OR, ONT., PA, TN, TX, WV, WI, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (12, 13, 113, 235, 114) TURBIDITY 0.3 - 180 NTU, OR LESS THAN 25 - 42 JTU; ALKALINITY (NOT STATED AS EITHER TOTAL OR ORTHO) 3.9 - 6.1, TOTAL as $CaCO_3$ 110 -226; BOD 1.4 - 3.0; TOT. HARDNESS 12 - 270; Ca - Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Ca 5.4 - 137; Mg 1.4 - 133; Si 2.9 - 47.6; Fe 0.00 - 0.71; Mn 0.00 - 0.01; Na 1.7 - 8.6; K 0.4 - 2.6; Cl 1 - 14; SO_4 0.2 - 21; Fl 0.0 - 0.6; DETERGENTS as ABS 0.0 - 0.2; TOT. KJ. N 0.03 - 0.22; B 0 - 0.06; SPEC. COND. 32 - 460; COLIFORMS 3 - 630/100 ML

(190, 235) ELEVATION 360 - 3140 FT.

(234) FOUND ABOVE, BUT NOT BELOW, A RESERVOIR

(141) ONE SITE SEVERELY AFFECTED IN WATER LEVEL BY UPSTREAM HYDROELECTRIC DAM

Leptoceridae *Oecetis inconspicua* (Walker)

	SOURCE / PARAMETERS	39	66	82	13	149	193	195	196	234	131	167	183	282	245	135	NOTES OR RANGES
	LARVAE				X				X					X			
	ADULT	X	X	X			X					X	X		X	X	
GENERAL HABITAT	LAKE/POND	X						X	X					X		X	
	RIVER				X	X				X	X				X		
	STREAM														X	X	
	SPRING																
	TEMP. WATERS																
SPECIFIC HABITAT	EPIBENTHIC ON													X			
	EMBENTHIC IN																
	EPILITHIC ROCK																
	EPIPHYTIC PLANT																
	OTHER													X			MUD
HOME	RETREAT BUILDER																
	CASE MAKER																
	FREELIVING																
DIET	CARNIVORE																
	HERBIVORE																
	OMNIVORE																
	DETRITIVORE																
	TURBIDITY				X											X	0.5 - 1.8
	CURRENT																
TEMP.	EUTHERMAL >30C																0 - 28
	MESOTHERMAL 15-30C	X			X						X					X	
	OLIGOTHERMAL <15C	X														X	
	STENOTHERMAL <5C															X	
PH	ACIDOBIONTIC <5.5																
	ACIDOPHILIC <7.0															X	5.9
	ALKALIPHILOUS >=7.0	X							X		X						
	ALKALIBIONTIC >8.5	X							X								8.75
DO	DISS. OXYGEN % SAT.				X											X	66 - 95
	MG/L				X						X					X	6.2 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.				X												0
	TOTAL				X				X								108 - 220
	NITRATES	X							X							X	0.0 - 10.4
	NITRITES	X			X											X	0 - 0.005
	AMMONIA	X			X				X								0.021 - 1.10
	PHOSPHORUS ORTHO	X			X				X							X	0.003 - 1.2
	TOTAL	X															0 - 0.155
	SEASONAL L				X									X			JAN. - DEC.
	DISTRIBUTION A	X	X												X		APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I																
	REGION II		X					X			X		X				
	REGION III																
	REGION IV																
	REGION V					X			X			X					
	REGION VI														X		
	REGION VII	X			X												
	REGION VIII																
	REGION IX			X													
	REGION X																

STATES AND PROVINCES MENTIONED: AR, BRIT. COL., BAJA CALIF., MI, MO, NY, OH, ONT., PUERTO RICO, QUEBEC, SASK.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (39, 13, 196, 135) SECCHI DISK 0.7 - 0.8 METERS; SPEC. COND. 17 - 230; TOT. HARDNESS as $CaCO_3$ 9.0 - 298; Fe 0.2 - 11.3; SiO_2 0.7 - 17.0; CO_2 0.8 - 16.0; Cl 4.0 15.0; SO_4 39.1 - 93.4; Ca 43.6 - 76.0; Mg 16.9 - 57; Na 1.4 14.6; TOT. ORG. C 4 - 20

(135) COLLECTED IN LAKES WITH AND WITHOUT SUMMER O_2 DEFICIT

(131) COLLECTED WITH ARTIFICIAL SUBSTRATE SAMPLER WHERE SECCHI DISK READING WAS 4.6 CM

(149) TURBID MUD-BROWN WATER FLOWING OVER SUBSTRATE OF SOFT BROWN MUD AND ORGANIC MATERIAL WITH A FEW EXPOSED AREAS OF GRAVEL

(234) FOUND ABOVE, BUT NOT BELOW, RESERVOIR

Leptoceridae *Triaenodes tarda* Milne

	SOURCE		39	167	245	210	NOTES OR RANGES
	PARAMETERS						
	LARVAE					X	
	ADULT		X	X	X	X	
GENERAL HABITAT	LAKE/POND		X			X	
	RIVER				X		
	STREAM				X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT				X	
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					13.5 - 18
	MESOTHERMAL	15-30C	X				
	OLIGOTHERMAL	<15C	X				
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0	X				7.8
	ALKALIBIONTIC	>8.5	X				9.8
DO	DISS. OXYGEN	% SAT.					
		MG/L	X				4.6 - 14.9
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES		X				0.017
	NITRITES						
	AMMONIA		X				0.015 - 0.028
	PHOSPHORUS	ORTHO	X				0.012
		TOTAL					
	SEASONAL	L				X	MAY - AUGUST
	DISTRIBUTION	A	X	X	X	X	MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III					X	
	REGION IV						
	REGION V			X			
	REGION VI				X	X	
	REGION VII		X				
	REGION VIII						
	REGION IX					X	
	REGION X						

STATES AND PROVINCES MENTIONED: MO, OH, AR, IL, D.C., MN, NEW BRUNS., NY, OK, ONT., PA, WI, AZ ?, B.C. ?

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (39) SECCHI DISK 1.8 METERS

LIMNEPHILIDAE

The limnephilids are probably the most diverse of all trichopteran families. There are over 300 species from 52 genera that have been recorded from North America. They are found in almost all lentic and lotic habitats and at both high and low elevations. Some genera even reside in temporary ponds and streams. The North American limnephilids are relegated to six subfamilies and these are reflected, to some extent, in their distribution and water quality tolerances. The Apatiinae are limited in distribution to cool northern or montane waters. The Dicosmoecinae are also limited to cool running waters, although one genus in this subfamily has been reported from northern temporary streams. The Goerinae are also restricted to cold lotic habitats with some members restricted to areas of spring seepage. The larvae of the largest subfamily, the Limnephilinae, occur in both cool and warm lentic and lotic habitats. The Neophylacinae are restricted to running waters as are the Pseudostenophylacinae. Larvae are not described for four limnephilid genera. We are able to include profiles for only twenty genera and fifty-four species of this family.

1. Genus *Allocosmoecus* Banks

Only one western species, *Allocosmoecus partitus* Banks, occurs in this genus. It is restricted to fast, cool streams where it grazes on periphyton.

2. Genus *Amphicosmoecus* (Ross)

Amphicosmoecus canax (Ross) is the sole representative of this genus. Larvae are collected from cool streams and lakes where it makes a case out of a hollow twig or rather thick pieces of bark. We have no water quality data for this genus.

3. Genus *Anabolia* Stephens

There are four described species of this genus in North America. The larvae are collected mostly from lentic habitats although they are also known from slow moving waters of rivers or streams and temporary pools. Larvae construct cases of elongate twigs and/or leaves and feed on detritus. We include a profile for *Anabolia bimaculata* (Walker).

4. Genus *Apatania* Kolenati

Larvae are known for six of the fifteen North American species of this genus. This genus is cool adapted and is northern or montane in distribution. We have no water data for any of the species of this genus.

5. Genus Arctopora Thomson

There are three North American species of this northern lentic genus. Only one, A. pulchella (Banks), is described. No water data are available for any species.

6. Genus Asynarchus McLachlan

Ten species of this genus are known from North America. Two of these are described. There are no keys to species of this genus and we have no water data. Apparently they are found in a variety of habitats (streams, ponds, and temporary pools) in the northern states.

7. Genus Chilostigma McLachlan

The larvae is unknown for this genus, consequently its habitat is unknown.

8. Genus Chilostigmodes Martynov

The larvae for this northern genus are unknown, therefore no water data for a profile are available.

9. Genus Chyranda Ross

Only one western species, C. centralis (Banks), is known for this genus. It is known from spring streams and constructs an elliptical tube case.

10. Genus Clistoronia Banks

Four western montane species of this genus are known. The larva of only C. magnifica (Banks) is known. It is collected from small ponds or lakes at high elevations. No water quality data are available for members of this genus.

11. Genus Clostoeca Banks

One recognized species of this genus occurs in western North America. C. disjuncta (Banks) is collected from spring seepage areas. Clostoeca has a flattened leaf case. No water data are available for this genus.

12. Genus Cryptochia Ross

Seven North American species are known for this genus. Only the larva of C. pilosa (Banks) is described. The genus is restricted to western North America and is collected from small spring streams. No water data is available for members of this genus.

13. Genus *Desmona* Denning

This monotypic genus is known only from California. Larvae of *D. bethula* are collected from sand deposits in spring streams. Apparently the larvae are detritivores. No water quality data are available for this genus.

14. Genus *Discosmoecus* McLachlan

Five species of this genus are known from North America. It is limited in distribution to streams in the western mountain states. Larvae are known for four of the five species although no taxonomic key is available. We include a brief profile for *D. gilvipes* (Wagen).

15. Genus *Ecclisocosmoecus* Schmid

This genus has one North American species, *E. scylla* (Milne). Larvae are collected concealed in sand and gravel from cold mountain streams at high elevations in British Columbia, Oregon, and Washington. No water quality data are available for a profile.

16. Genus *Ecclisomyia* Banks

This is a small western montane genus with three North American species. The larvae are restricted to swift mountain streams. We have limited profiles for two species, *E. bilera* Denning and *E. maculosa* Banks.

17. Genus *Farula* Milne

Seven western montane species belong to this genus. Larvae are restricted to clear, cold mountain streams. Their case is constructed of fine sand grains and is extremely long and slender. No water data are available for this genus.

18. Genus *Frenesia* Betten and Mosely

The two described species of this genus are known only from eastern North America. Although water data is not available for a profile, they are reported only from cold springs and seepage areas where they feed on detritus during the summer and emerge as adults in the fall.

19. Genus *Glyphopsyche* Banks

Two species, *G. irrorata* Fab. and *G. missouri* Ross, are known from North America. The larvae of both species are described. *G. irrorata* is a northern and western, cold-water species that occurs in marshes and slow streams. *G. missouri* is a spring species known only from Missouri. We have water data for *G. missouri*.

20. Genus *Goera* Curtis

There are six known species of this genus in North America. Although larvae of four of these species have been described, we have only minimal water data available for two species, *G. fuscula* (Banks) and *G. stylata* (Ross). The larvae are lotic and are found in "relatively unpolluted" streams. They are the only goerine larvae with branched gills.

21. Genus *Goeracea* Ross

Two western species of this genus are known, *G. genota* Ross and *G. oregona* Denning. Although we have no water quality profiles for this genus, it is known that they are western species, restricted to cold, mountain streams.

22. Genus *Goereilla* Denning

This monotypic genus known only from Montana and Idaho where it inhabits spring seepage areas where it is found in muck and ooze. We have no water data for this genus.

23. Genus *Goerita* Ross

This eastern, montane genus has two species, *G. semanta* Ross and *G. betteni* Ross. Both are known from cold, mountain streams.

24. Genus *Grammotaulius* Kolenati

Five North American species of this genus are known. The larvae of one, *G. lorettae* Denning, is described. The genus is primarily restricted to the western states and has been collected most often from lentic habitats that are rich in plant material. We have no profile for this genus.

25. Genus *Grensia* Ross

This extremely northern genus has only one species, *G. praeterita* (Walker). Its distribution is mainly confined to lentic habitats north of the artic circle. No water data are available for this genus.

26. Genus *Halesochila* Banks

One species of this genus, *H. taylori* (Banks), is known only from Region X. The larvae are restricted to lentic habitats and are found in the sediments. No water quality data are available for this species.

27. Genus *Hesperophylax* Banks

Six species of this genus are known from North America. The larvae occur in both lentic and lotic habitats as well as temporary streams. We have minimal water quality data available for *H. designatus* (Walker).

28. Genus Homophylax Banks

This is a western, montane genus with ten known species. Larvae are known for only H. andax which is collected from small, cold mountain streams. We have no water data for this genus.

29. Genus Hydatophylax Wallengren

This genus has four North American species. Larvae are generally found in pool areas of small streams, although they are reported from lentic habitats. Larvae are described for two species, H. argus (Harris) and H. hesperus (Banks). We include a minimal profile for H. argus.

30. Genus Imania Martynov

This is a western montane genus in North America with eleven known species. They require cool, highly oxygenated water and are collected from small, cold mountain streams. Larvae are known for four species, although no water quality data are available.

31. Genus Ironoquia Banks

Larvae are described for two of the four North American species of this genus. The larvae occur in temporary pool and streams in eastern North America. Larvae can aestivate in leaf litter to avoid drought. We have profiles for the two described larvae, I. punctatissima (Walker) and I. parvula (Banks).

32. Genus Lenarchus Martynov

Although nine, mostly northern and western species of this genus are known, the larvae for only L. vastus (Hagen) is known. It is collected from lentic waters in small lakes, ponds, and marshes at higher elevations. We have no water quality data for this genus.

33. Genus Lepania Ross

L. cascada Ross is the only known species of this genus. It is known from muck in spring seepage areas in mountainous areas of Region X. Although no water quality data is available for this species, its restricted habitat indicates it is an intolerant species.

34. Genus Leptophylax Banks

Only one species, L. gracilis Banks, is known. Nothing is known of the biology or water quality requirements of the genus as its larvae remain undiscovered.

35. Genus Limnephilus Leach

Members of this, the largest genus of the Limnephilidae, are found throughout the North America in predominantly lentic habitats. Of the 95 known species we have minimal water quality profiles for eleven. Some members of this genus can exploit temporary streams and pools.

36. Genus Manophylax Wiggins

This genus is known only from Idaho where it is known from a small mountainous stream. We have no water data available for M. annulatus Wiggins, its sole representative.

37. Genus Moselyana Denning

M. comosa is the only known representative of this genus. It is collected from muck and organic matter of spring seeps. It is known only from Oregon. We have no water data available for this genus.

38. Genus Nemotaulis Banks

There is one North American species of this genus, N. hostilis (Hagen). Larvae are lentic, and have been collected from lakes and small ponds with dense emergent vegetation. We include minimal water data for this species.

39. Genus Neophylax McLachlan

There are 15 species of this lotic genus in North America and we include water data for eight. Larvae construct cases of small stones with larger stones on each side. Larvae in diapause are often found in clusters on the tops of rocks.

40. Genus Neothremma Banks

The six species of this genus are restricted to the western mountain regions of North America. Larvae are collected from mountain streams. Larval description of only one of the species has been published. We have water quality data on N. alicia Banks.

41. Genus Oligophlebodes Ulmer

Members of this genus are restricted to the western mountain areas of North America. Larvae are described for two of the seven species known. We include water data for O. minuta (Banks) and O. sierra Ross.

42. Genus Onocosmoecus Banks

Approximately six species of this genus occur in North America in quiet, cool water habitats. Larvae are found in deposits of allochthonous detritus and pupate in the sediment. We include data for O. unicolor (Banks) from emergence trap collections. No larval keys are available for this genus.

43. Genus Pedomoecus Ross

P. sierra Ross is the only known representative of this genus which is only collected in mountainous areas of Regions IX and X. We include minimal data for this lotic limnephilid.

44. Genus Phanocelia Banks

The larvae of *P. canadensis* Banks is unknown, therefore, nothing is known of the water quality requirements of this northern genus.

45. Genus Philarctus McLachlan

There is but one North American species of this genus, *P. quaeris* (Milne). It is known from small ponds and slow moving streams in the aspen parkland. We have no water data for this species.

46. Genus Philocasca Ross

Larvae of two of the six North American species of this genus are described. One species, *P. demita*, is known only from terrestrial collections. The genus is apparently restricted to spring stream habitats in the western, mountain states.

47. Genus Platycentropus Ulmer

There are three eastern species of this genus in North America. The larvae of only one, *P. radiatus* (Say), is described. The larvae are apparently quite tolerant of high temperatures. We have a limited profile for *P. radiatus*.

48. Genus Pseudostenophylax Martynov

There are three eastern species and one western species of this genus in North America. We include profiles of one eastern, *P. uniformis* (Betten) and one western, *P. edwardsi* (Banks), species. Larvae occur in shallow streams and are able to burrow into sand and gravel to avoid dessication during intermittant flow.

49. Genus Psychoglypha Ross

Although fifteen species of this genus are known, only *P. subborealis* (Banks) is described. We have water quality data for three additional species. The genus is primarily western and montane, with the exception of *P. subborealis* which is northern. Larvae appear to be restricted to cool water highly oxygenated lentic or lotic habitats.

50. Genus Psychoronia Banks

Two species of this genus are known from Colorado and New Mexico. Larvae of one species, P. costalis(Banks), is described. It is known from a mountain stream at high elevation. We have no water data for this genus.

51. Genus Pycnopsyche Banks

This is probably the most commonly encountered limnephilid genus east of the Rocky Mountains. There are sixteen known species and we include water quality data available for eleven. Most larvae appear to be restricted to cool, rather slow moving streams of the Temperate Deciduous Forest.

52. Genus Rossiana Denning

One species, R. montana Denning, is known from Region X. Larvae occur in cold mountain streams. We have no water data for this species.

Limnephilidae *Allocosmoecus partitus* Banks

	SOURCE		5	275	10	NOTES OR RANGES
	PARAMETERS					
	LARVAE			X	X	
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM			X	X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON			X	
	EMBENTHIC	IN				
	EPILITHIC	ROCK			X	
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER			X	X	SMALL STONES
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE			X		
	TURBIDITY		X			0.2 - 3.6
	CURRENT		X			71 CM/S
TEMP.	EUTHERMAL	>30C				6 - 13.5
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C	X			
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0	X			7.3 - 7.6
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			53 - 58
	NITRATES		X			0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO	X			0.2 - 0.57
		TOTAL				
	SEASONAL DISTRIBUTION	L		X		JUNE - JULY
		A		X	X	SEPT. - NOV.
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX			X	X	
	REGION X		X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, ID, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) HARDNESS as $CaCO_3$ 53 - 58; SPEC. COND. 9.2 - 118; Ca 5.9 - 8.0

(275) SMALL COOL STREAMS

(10) CLEAR-CUT AREA WHERE LARVAE GRAZED PERIPHYTON ON LARGE RUBBLE IN CASCADE TYPE STREAM, PUPAE ON UNDERSIDE OF STONES

Limnephilidae *Anabolia bimaculata* (Walker)

	SOURCE	106	41	275	135	NOTES OR RANGES
	PARAMETERS					
	LARVAE	X	X	X		
	ADULT				X	
GENERAL HABITAT	LAKE/POND	X			X	MARSH
	RIVER		X			
	STREAM			X		
	SPRING					
	TEMP. WATERS			X		
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER	X		X		STEMS OR TWIGS
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL >30C					0 - 22
	MESOTHERMAL 15-30C		X			
	OLIGOTHERMAL <15C		X			
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0		X			5.9
	ALKALIPHILOUS >=7.0		X			8.4
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL					
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL		X			SEE COMMENTS
	SEASONAL DISTRIBUTION L			X		JUNE
	A					
GEOGRAPHIC DISTRIBUTION	REGION I	X				
	REGION II	X				
	REGION III					
	REGION IV					
	REGION V	X				
	REGION VI					
	REGION VII					
	REGION VIII	X				
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: ALB., CO, MN, NH, NY, N.W. TERR., ONT.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M^3 HCO_3 560 - 8100; SO_4 70 - 340; Cl $<$10 - 300; N 9.2 - 98; P $<$0.05 - 3.4; Si 31 - 270; IN MOLES/M^3 Ca 0.17 - 2.2; Mg 0.07 - 0.79; Na 0.01 - 0.5 ; K 0.01 - 0.06; O_2 0.04 - 0.37

(106) VERY SIMILAR TO *Sordida* BUT FOUND AT HIGHER ALTITUDES OR FARTHER NORTH

(135) COLLECTED IN LAKES WITH AND WITHOUT SUMMER O_2 DEFICIT

Chyrandra centralis (Banks)

	SOURCE		6	144	282	275	NOTES OR RANGES
	PARAMETERS						
	LARVAE				X	X	
	ADULT		X	X			
GENERAL HABITAT	LAKE/POND			X	X		
	RIVER						
	STREAM		X			X	
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN				X	
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT				X	IN LEAF ACCUMULATIONS
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER					X	BARK OR LEAVES
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE					X	
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					3 - 10.6
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C	X	X			
	STENOTHERMAL	<5C		X			
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0	X				7.0
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L					
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL	L				X	JUNE
	DISTRIBUTION	A	X	X			JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII					X	
	REGION IX					X	
	REGION X		X			X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., OR, ACROSS MOST OF CANADA, NORTH TO ALASKA, SOUTH TO CALIFORNIA, UTAH, AND COLORADO

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (144) SPECIMENS COLLECTED WITH EMERGENCE TRAPS, WITH WATER TEMPERATURE DURING EMERGENCE 7.5 - 9 C

(6) ELEVATION 700 FT

Limnephilidae *Discosmoecus gilvipes* (Hagen)

	SOURCE / PARAMETERS	5	69	217	275	NOTES OR RANGES
	LARVAE	X	X		X	
	ADULT	X	X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER	X				
	STREAM		X		X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON				X	
	EMBENTHIC IN					
	EPILITHIC ROCK				X	
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER	X			X	FINE GRAVEL
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY	X				0.2 - 3.6
	CURRENT	X				71 CM/S
TEMP.	EUTHERMAL >30C					6 - 13.5
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C	X				
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0	X				7.3 - 7.6
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL	X				53 - 58
	NITRATES	X				0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO	X				0.2 - 0.57
	TOTAL					
	SEASONAL DISTRIBUTION L				X	SEPTEMBER
	A	X	X	X		APRIL - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX		X			
	REGION X	X	X		X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, ID, NV, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) HARDNESS as $CaCO_3$ 41.2 - 48.8; Ca 5.9 - 8; SPEC. COND. 92 - 118

Limnephilidae *Ecclisomyia bilera* Denning

	SOURCE PARAMETERS		72	1	NOTES OR RANGES
	LARVAE			X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	1.0 - 12.8
	CURRENT			X	0.65 - 1.54 M/S
TEMP.	EUTHERMAL	>30C			4.0 - 17.1
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C		X	
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0		X	8.15 - 8.50
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL		X	114 - 189
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A	X		JULY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII			X	
	REGION IX		X		
	REGION X				

STATES AND PROVINCES MENTIONED: CA, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (1) TOT. HARDNESS as $CaCO_3$ 144 - 328, OPTIMUM = 196; FOLLOWING ARE OPTIMUM VALUES FOR THE PARAMETERS, MEANING THE PARAMETER VALUE AT WHICH HIGHEST SPECIES DENSITY WAS RECORDED. TEMPERATURE = 5.4; CURRENT = 0.65 M/S; TURBIDITY 1.0 JTU; pH = 8.30

(72) ELEVATION 7400 FT

Limnephilidae *Ecclisomyia maculosa* Banks

	SOURCE / PARAMETERS	5	72	10	144	242	68	275	NOTES OR RANGES
	LARVAE	X				X		X	
	ADULT	X	X	X	X		X		
GENERAL HABITAT	LAKE/POND				X				
	RIVER								
	STREAM	X		X		X	X	X	
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON							X	
	EMBENTHIC IN								
	EPILITHIC ROCK							X	
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								ROCK FRAGMENTS & SOMETIMES WITH PLANT MATERIAL
	CASE MAKER			X				X	
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE							X	
	TURBIDITY	X							0.2 - 3.6
	CURRENT	X							71 CM/S
TEMP.	EUTHERMAL >30C								3 - 13.5
	MESOTHERMAL 15-30C								
	OLIGOTHERMAL <15C	X			X				
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0	X							7.3 - 7.6
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L								
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL	X							53 - 58
	NITRATES								
	NITRITES	X							0.01 - 0.05
	AMMONIA								
	PHOSPHORUS ORTHO	X							0.2 - 0.57
	TOTAL								
	SEASONAL L								
	DISTRIBUTION A		X	X	X		X		APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V								
	REGION VI								
	REGION VII								
	REGION VIII		X	X			X		
	REGION IX								
	REGION X	X	X	X		X			

STATES AND PROVINCES MENTIONED: BRIT. COL., ALB., CO, MT, OR, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; SOLIDS 90 - 114

(72, 10, 68) ELEVATION 4400 - 10,700 FT

(144) COLLECTED WITH EMERGENCE TRAPS, TEMPERATURE OF WATER DURING EMERGENCE 8 - 8.2 C, AND DURING ENTIRE YEAR 3 - 9 C

(68) SWIFT FLOWING, SHALLOW, NARROW MOUNTAIN STREAM

Limnephilidae *Glyphopsyche missouri* (Ross)

	SOURCE PARAMETERS	106	210	13	259	275	NOTES OR RANGES
	LARVAE	X	X	X		X	
	ADULT	X	X		X		
GENERAL HABITAT	LAKE/POND						
	RIVER		X	X			
	STREAM		X				
	SPRING		X		X		
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON	X	X				
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT	X	X				MATS OF WATER CRESS
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER	X	X			X	ROCK AND PLANT PIECES
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY			X			<25
	CURRENT						
TEMP.	EUTHERMAL >30C						13.5 - 14.6
	MESOTHERMAL 15-30C			X			
	OLIGOTHERMAL <15C						
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0			X			7.3 - 7.5
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.			X			85 - 90
	MG/L			X			8.8 - 9.4
H_2O CHEMISTRY	ALKALINITY PHTH.			X			0
	TOTAL			X			72 - 177
	NITRATES			X			0.6
	NITRITES			X			0.000
	AMMONIA			X			0.25 - 0.90
	PHOSPHORUS ORTHO			X			<0.1
	TOTAL						
	SEASONAL L		X	X			MARCH - DECEMBER
	DISTRIBUTION A		X		X		OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII	X	X	X	X	X	
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: MO

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (13) SPEC. COND. 145 - 310; COLIFORMS 16 - 72/100 ML; TOT. HARDNESS as $CaCO_3$ 69 - 176; DETERGENTS as ABS 0.0; Ca 45 - 95; Mg 24 - 81; Si 5.4; Fe 0.08; Mn 0.00; Na 1.4; K 1.3; SO_4 5.4; Cl 1.4; F 0.1

Limnephilidae *Hesperophylax designatus* (Walker)

	SOURCE / PARAMETERS		106	210	143	275	NOTES OR RANGES
	LARVAE		X	X	X	X	
	ADULT		X	X			
GENERAL HABITAT	LAKE/POND		X				
	RIVER		X		X		
	STREAM			X			
	SPRING		X	X			
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON	X				
	EMBENTHIC	IN	X				
	EPILITHIC	ROCK	X				
	EPIPHYTIC	PLANT	X				
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER		X				SAND
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE		X				
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					5 - 13
	MESOTHERMAL	15-30C			X		
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0			X		6.9
	ALKALIPHILOUS	>=7.0			X		8.5
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L			X		0.4 - 17.6
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL			X		80 - 170
	NITRATES				X		0 - 0.2
	NITRITES				X		0 - <0.01
	AMMONIA				X		<0.01 - 0.17
	PHOSPHORUS	ORTHO			X		0 - 0.03
		TOTAL			X		0 - 0.18
	SEASONAL DISTRIBUTION	L			X	X	MARCH - JULY
		A	X	X			MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			X			
	REGION II			X			
	REGION III						
	REGION IV						
	REGION V			X	X		
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, ME, MI, MN, NH, NY, NOVA SCOTIA, ONT., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (143) TOT. COLIFORMS <100 - 16000 PER 100 ML; FECAL COLIFORMS <10 - 90; ORG. N <0.1 - 0.5; HARDNESS as $CaCO_3$ 80 - 175; SUSP. SOLIDS 0 - 8.0

Limnephilidae *Hydatophylax argus* (Harris)

	SOURCE / PARAMETERS		106	167	275	NOTES OR RANGES
	LARVAE		X		X	
	ADULT			X		
GENERAL HABITAT	LAKE/POND					
	RIVER			X		
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON			X	
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT			X	
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X		X	WOOD OR LEAVES
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE				X	
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0		X		7 - 8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.		X		90 - 115
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		40 - 117
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL DISTRIBUTION	L	X			FALL - WINTER
		A	X			SPRING
GEOGRAPHIC DISTRIBUTION	REGION I		X			
	REGION II		X			
	REGION III		X			
	REGION IV		X		X	
	REGION V			X	X	
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: MA, MD, NH, NY, NC, OH, SOUTH CAROLINA TO QUEBEC AND WEST TO MINNESOTA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 8.5; HARDNESS as $CaCO_3$ 115 - 240; Cl 35 - 75; TOT. COLIFORMS 3/100 ML

Ironoquia parvula (Banks)

	SOURCE	106	210	105	167	275	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X		X		X	
	ADULT	X	X		X		
GENERAL HABITAT	LAKE/POND	X		X			
	RIVER						
	STREAM					X	
	SPRING						
	TEMP. WATERS	X				X	
SPECIFIC HABITAT	EPIBENTHIC ON	X				X	
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT	X				X	
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER	X				X	SAND GRAINS
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL >30C						MAX = 28
	MESOTHERMAL 15-30C			X			
	OLIGOTHERMAL <15C						
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0			X			6.38
	ALKALIPHILOUS >=7.0			X			7.48
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L						
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL			X			13.6 - 74.8
	NITRATES			X			0.29 - 0.64
	NITRITES			X			0.01 - 0.113
	AMMONIA			X			0.0 - 1.546
	PHOSPHORUS ORTHO			X			0.021 - 0.98
	TOTAL			X			0.050 - 0.624
	SEASONAL L	X		X			MARCH - AUGUST
	DISTRIBUTION A	X					SEPT. - OCT.
GEOGRAPHIC DISTRIBUTION	REGION I	X					
	REGION II	X	X				
	REGION III			X			
	REGION IV						
	REGION V				X		
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: MA, NH, NJ, NY, NEW BRUNS., OH, PA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (105) SPEC. COND. 77.7 - 131.61; HARDNESS as $CaCO_3$ 31.8 - 49.4; SO_4 10.9 - 23.7; Cl 0.000 - 50.76; Ca 6.27 - 11.09; Mg 3.44 - 6.56; Na 2.89 - 6.09; K 1.13 - 3.02; Fe 0.405 - 4.31; Mn 0.054 - 1.87; Zn 0.000 - 0.035; Cr 0-000 - 0.005; Cu 0.007 - 0.012; Pb 0.003 - 0.005; Cd 0.000 - 0.002; Hg 0.000 - 0.003; B 0.01 - 0.016

Limnephilidae *Ironoquia punctatissima* (Walker)

	SOURCE PARAMETERS	106	126	62	167	180	275	210	276	141	231	NOTES OR RANGES
	LARVAE	X	X	X			X		X	X	X	
	ADULT	X			X			X			X	
GENERAL HABITAT	LAKE/POND	X										MARSH
	RIVER									X		
	STREAM	X	X	X		X		X	X			
	SPRING											
	TEMP. WATERS							X				
SPECIFIC HABITAT	EPIBENTHIC ON		X							X	X	
	EMBENTHIC IN											
	EPILITHIC ROCK											
	EPIPHYTIC PLANT		X							X	X	
	OTHER											
HOME	RETREAT BUILDER											
	CASE MAKER	X					X				X	BARK AND LEAVES
	FREELIVING											
DIET	CARNIVORE											
	HERBIVORE											
	OMNIVORE											
	DETRITIVORE											
	TURBIDITY			X							X	4 - 86
	CURRENT								X	X	X	0 - 50 CM/S
TEMP.	EUTHERMAL >30C											1.5 - 30
	MESOTHERMAL 15-30C			X					X		X	
	OLIGOTHERMAL <15C								X		X	
	STENOTHERMAL <5C								X		X	
PH	ACIDOBIONTIC <5.5											
	ACIDOPHILIC <7.0										X	6.2
	ALKALIPHILOUS >=7.0			X		X			X		X	
	ALKALIBIONTIC >8.5			X		X			X			9.4
DO	DISS. OXYGEN % SAT.											
	MG/L					X					X	3.6 - 14.5
H_2O CHEMISTRY	ALKALINITY PHTH.											
	TOTAL											
	NITRATES			X		X					X	0.150 - 1.76
	NITRITES			X		X					X	0 - 0.66
	AMMONIA					X					X	0.25 - 1.58
	PHOSPHORUS ORTHO			X		X					X	0 - 6
	TOTAL										X	0.20 - 0.75
	SEASONAL L	X	X						X		X	OCTOBER - MAY
	DISTRIBUTION A	X									X	AUGUST - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I	X	X									
	REGION II	X					X					
	REGION III						X					
	REGION IV	X									X	
	REGION V	X			X	X		X		X		
	REGION VI											
	REGION VII											
	REGION VIII											
	REGION IX											
	REGION X											

STATES AND PROVINCES MENTIONED: GA, IL, IN, MA, MI, NH, NC, NY, NOVA SCOTIA, OH, ONT., SC, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 180, 231) SPEC. COND. 9.5 - 473; ORG. C 4.0 - 17.0; KJ. N 0.58 - 1.8; DETERGENTS as ABS 0.5 - 2.1; TOT. COLIFORMS UP TO 7.5 X 10^6/100 ML; *E. coli* 51400/100 ML; TOT. PHENOXYS 0 - 2.81 µG/L; PCB 0 - 0.25 µG/L; TOT. DDT 0 - 0.10 µG/L; SO_4 0 - 26; CO_3 5 - 50; SUSP. SOLIDS 12; BOD 1 - 3; Na 2.0 - 9.7; K 1.2 - 8.3; As 0.01 - 0.20; Cd 0.01 - 0.02; Cu 0.03 - 0.18; Pb 0.01 - 0.02

(62) $NO_2 + NO_3$ 0.01 - 0.47. APPROX. TWO MONTHS PER YEAR NO FLOW BETWEEN POOLS, SUMMER HAD DENSE GROWTHS OF *Cladophora*

(276) O_2 LEVELS NORMALLY NEAR SATURATION, EXCEPT IN SUMMER WHEN POOLS MAY BECOME STAGNANT OR MID-WINTER WHEN ICE COVERED STREAM

(231) ELEVATION 52 - 732 METERS

Limnephilidae *Limnephilus alberta* Denning

	SOURCE		144	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER			
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		3 - 9
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: ALBERTA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (144) SPECIMENS CAUGHT WITH EMERGENT TRAPS, WATER TEMPERATURE DURING EMERGENCE PERIOD WAS 7.5 - 9 C

Limnephilidae *Limnephilus consocius* Walker

	SOURCE / PARAMETERS		210	171	234	167	NOTES OR RANGES
	LARVAE		X	X	X		
	ADULT		X			X	
GENERAL HABITAT	LAKE/POND						
	RIVER				X	X	
	STREAM			X			
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER		X				WOOD & LEAF FRAGMENTS
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					0 - 24.5
	MESOTHERMAL	15-30C				X	
	OLIGOTHERMAL	<15C		X		X	
	STENOTHERMAL	<5C				X	
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0		X		X	7 - 8.2
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.				X	89 - 115
		MG/L					
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL				X	40 - 123
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL DISTRIBUTION	L					
		A	X				JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X				
	REGION II		X				
	REGION III						
	REGION IV						
	REGION V		X	X		X	
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, ME, MI, NH, NY, OH, ONT., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 2.0 - 8.0; HARDNESS as $CaCO_3$ 115 - 230; TOT. COLIFORMS 323/100 ML; Cl 30 - 70; AVG. STREAM WIDTH 8 - 10 M

(234) FOUND BOTH ABOVE AND BELOW STUDY RESERVOIR

(171) LC_{50} TO EXPOSURE TO TFM (3 TRIFLUOROMETHYL - 4 - NITROPHENOL) AT 24 HR. WAS GREATER THAN 39.0 MG/L, AND AT 96 HR. ALSO GREATER THAN 39.0 MG/L.

MEAN PHYSIOCHEMICAL CONDITIONS OF TEST DILUTION WATER. ALKALINITY as $CaCO_3$ 179; Ca 152; TOT. C 39; Cl 2.8; SPEC. COND. 397; HARDNESS as $CaCO_3$ 211; Fe 0.2; NO_3 1.31; NO_2 4.3 uG/L; P 0.01; Na 2.4; TOT. SOLIDS 231; SO_4 15.0

Limnephilidae *Limnephilus externus* Hagen

	SOURCE		10	144	217	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X			
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND		X	X		
	RIVER				X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON	X			
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT	X			
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X			
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				3 - 9
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C		X		
	STENOTHERMAL	<5C		X		
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0				
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X		APRIL - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX		X			
	REGION X		X			

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, N.W. TERR., NEWFOUNDLAND, OR, QUE., WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (144) SPECIMENS COLLECTED WITH EMERGENT TRAPS, TEMPERATURE OF WATER DURING EMERGENCE WAS 7.0 - 7.5 C

Limnephilidae *Limnephilus frijole* Ross

	SOURCE / PARAMETERS	82	10	152	NOTES OR RANGES
	LARVAE			X	(10) PUPAE
	ADULT	X	X		
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER		X		
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE			X	
	OMNIVORE				
	DETRITIVORE			X	
	TURBIDITY			X	125
	CURRENT				
TEMP.	EUTHERMAL >30C			X	0 - 31.9
	MESOTHERMAL 15-30C			X	
	OLIGOTHERMAL <15C			X	
	STENOTHERMAL <5C			X	
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0				
	ALKALIPHILOUS >=7.0			X	8.0
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL			X	202
	NITRATES			X	0.531
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO			X	0.372
	TOTAL				
	SEASONAL L			X	JANURARY - APRIL
	DISTRIBUTION A				
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI		X		
	REGION VII				
	REGION VIII			X	
	REGION IX	X	X		
	REGION X		X		

STATES AND PROVINCES MENTIONED: CA, ID, NM, OR, TX, UT, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (152) SPEC. COND. 625; TOT. HARDNESS as $CaCO_3$ 331; ELEVATION 1517 METERS

Limnephilidae *Limnephilus janus* Ross

	SOURCE		144	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER			
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		3 - 9
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: ALBERTA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (144) SPECIMENS COLLECTED WITH EMERGENT TRAPS, TEMPERATURE OF WATER DURING EMERGENCE WAS 7.5 C

Limnephilidae *Limnephilus indivisus* (Walker)

	SOURCE		105	210	145	167	270	275	NOTES OR RANGES
	PARAMETERS								
	LARVAE		X	X	X		X	X	(145) PUPAE
	ADULT			X	X	X	X		
GENERAL HABITAT	LAKE/POND		X		X		X		ALSO MARSHES
	RIVER					X			
	STREAM								
	SPRING								
	TEMP. WATERS						X		
SPECIFIC HABITAT	EPIBENTHIC	ON			X				
	EMBENTHIC	IN							
	EPILITHIC	ROCK							
	EPIPHYTIC	PLANT			X				
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER		X	X				X	
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT								
TEMP.	EUTHERMAL	>30C							0 - 24.5
	MESOTHERMAL	15-30C				X			
	OLIGOTHERMAL	<15C				X			
	STENOTHERMAL	<5C				X			
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0							
	ALKALIPHILOUS	>=7.0				X			7.0 - 8.2
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.				X			89 - 115
		MG/L							
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL				X			40 - 123
	NITRATES								
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO							
		TOTAL							
	SEASONAL	I					X	X	MAY - SEPTEMBER
	DISTRIBUTION	A							
GEOGRAPHIC DISTRIBUTION	REGION I		X	X					
	REGION II		X	X					
	REGION III		X		X				
	REGION IV								
	REGION V		X	X		X			
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: IL, MA, MI, NH, NY, NOVA SCOTIA, OH, ONT., PA, ME, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 2.0 - 8.0; TOT. HARDNESS as $CaCO_3$ 115 - 230; TOT. COLIFORMS 323/100 ML; Cl 30 - 70; MEAN STREAM WIDTH 8 - 10 M

Limnephilidae *Limnephilus lunonus* Ross

	SOURCE / PARAMETERS	41	5	10	NOTES OR RANGES
	LARVAE	X		X	
	ADULT		X	X	
GENERAL HABITAT	LAKE/POND	X			
	RIVER		X		
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER			X	
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY		X		0.2 - 3.6
	CURRENT		X		71 CM/S
TEMP.	EUTHERMAL >30C				0 - 20
	MESOTHERMAL 15-30C	X			
	OLIGOTHERMAL <15C	X	X		
	STENOTHERMAL <5C	X			
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0	X			6.9
	ALKALIPHILOUS >=7.0	X	X		
	ALKALIBIONTIC >8.5	X			8.9
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL		X		53 - 58
	NITRATES		X		0.01 - 0.05
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO		X		0.2 - 0.57
	TOTAL				
	SEASONAL L			X	MAY
	DISTRIBUTION A			X	MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX			X	
	REGION X		X	X	

STATES AND PROVINCES REPORTED FROM: CA, N.W.TERR., OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) IN MILLIMOLES/M^3 O_2 0.0 - 0.52; Ca 0.48 - 1.5; Mg 0.26 - 0.81; Na 0.16 - 0.39; K 0.02 - 0.08; SO_4 200 - 530; Cl 60 - 410; HCO_3 1300 - 4400; N 1.2 - 43; P 0.16 - 3.0; Si 1.5 - 40; Fe 0.16 - 52; Mn <0.10 - 18; Zn 0.02 - 0.61; Cu 0.03 - 0.20; Pb <0.01 - 0.01 Cd <0.01; SECCHI DISK 0.17 - 1.6 M

(5) HARDNESS 44.2 - 48.8; SPEC. COND. 90 - 110 Ca 5.9 - 8; AVG. DEPTH 21.3 CM; AVG. WIDTH 30.1 CM

Limnephilidae *Limnephilus morrisoni* Banks

	SOURCE / PARAMETERS	5	10	NOTES OR RANGES
	LARVAE			
	ADULT	X	X	
GENERAL HABITAT	LAKE/POND			
	RIVER	X		
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		0.2 - 3.6
	CURRENT	X		71 CM/S
TEMP.	EUTHERMAL >30C			6 - 13.5
	MESOTHERMAL 15-30C			
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		7.3 - 7.6
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		53 - 58
	NITRATES	X		0.01 - 0.05
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO	X		0.2 - 0.57
	TOTAL			
	SEASONAL L			
	DISTRIBUTION A			
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX		X	
	REGION X	X	X	

STATES AND PROVINCES MENTIONED: CA, NV, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM, WIDTH 30.5 M

Limnephilidae *Limnephilus ornatus* (Banks)

	SOURCE PARAMETERS		210	122	265	NOTES OR RANGES
	LARVAE			X		
	ADULT		X		X	
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM			X		
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0				
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X		X	APRIL - JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X			
	REGION II		X			
	REGION III					
	REGION IV					
	REGION V		X			
	REGION VI					
	REGION VII					
	REGION VIII			X		
	REGION IX					
	REGION X		X			

STATES AND PROVINCES MENTIONED: AR, IL, ME, MA, NH, NY, NEWFOUNDLAND, ONT.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (122) MEAN TEMPERATURE AT WHICH 50% OF TEST ORGANISMS DIED AFTER 96 HOUR EXPOSURE IN LAB = 24.75 C

Limnephilidae *Limnephilus rhombicus* (Linn.)

	SOURCE PARAMETERS	105	210	132	139	140	145	265	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X		
	ADULT		X				X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER			X					
	STREAM						X		
	SPRING		X						
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON					X			
	EMBENTHIC IN								
	EPILITHIC ROCK					X			
	EPIPHYTIC PLANT					X			
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER	X	X		X	X			
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE					X	X		
	DETRITIVORE								
	TURBIDITY								
	CURRENT								
TEMP.	EUTHERMAL >30C								10.3 - 25.5
	MESOTHERMAL 15-30C			X					
	OLIGOTHERMAL <15C						X		
	STENOTHERMAL <5C								
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0			X			X		7.3 - 8.5
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L			X			X		.4 - 11.2
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL								
	NITRATES			X					SEE COMMENTS
	NITRITES			X					SEE COMMENTS
	AMMONIA			X					0.01 - 0.06
	PHOSPHORUS ORTHO			X					0.082 - 0.335
	TOTAL			X					0.118 - 0.408
	SEASONAL L			X					
	DISTRIBUTION A								
GEOGRAPHIC DISTRIBUTION	REGION I		X						
	REGION II		X						
	REGION III						X		
	REGION IV								
	REGION V		X	X					
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AK, IL, ME, MI, MN, ND, NY, NEWFOUNDLAND, ONT., PA, SASK., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (132) $NO_3 + NO_2$ 1.2 - 3.9; ORG. N 1.21 - 3.93; TOT. SOLIDS 193 - 240; Cl 16 - 36

[105] SEEMED TO DECREASE IN NUMBERS DUE TO POLLUTION AND WARMING OF STREAM

Limnephilidae *Limnephilus submonilifer* (Walker)

	SOURCE	105	210	132	167	265	270	245	275	NOTES OR RANGES
	PARAMETERS									
	LARVAE	X	X	X					X	
	ADULT	X	X		X	X	X	X		
GENERAL HABITAT	LAKE/POND		X			X	X			MARSH ALSO
	RIVER			X						
	STREAM							X		
	SPRING									
	TEMP. WATERS	X	X			X	X			
SPECIFIC HABITAT	EPIBENTHIC ON									
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT									
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER	X	X						X	
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY									
	CURRENT									
TEMP.	EUTHERMAL >30C									25.5 (MAX.)
	MESOTHERMAL 15-30C			X						
	OLIGOTHERMAL <15C									
	STENOTHERMAL <5C									
PH	ACIDOBIONTIC <5.5									
	ACIDOPHILIC <7.0									
	ALKALIPHILOUS >=7.0			X						8.35 - 8.5
	ALKALIBIONTIC >8.5									
DO	DISS. OXYGEN % SAT.									
	MG/L			X						3.4 (MIN.)
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL									
	NITRATES			X						SEE COMMENTS
	NITRITES			X						SEE COMMENTS
	AMMONIA			X						0.01 - 0.06
	PHOSPHORUS ORTHO			X						0.082 - 0.335
	TOTAL			X						0.118 - 0.408
	SEASONAL L			X						
	DISTRIBUTION A		X			X				
GEOGRAPHIC DISTRIBUTION	REGION I		X							
	REGION II		X							
	REGION III		X							
	REGION IV									
	REGION V		X	X	X					
	REGION VI							X		
	REGION VII									
	REGION VIII		X							
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: AR, D.C., IL, IN, ME, MA, MI, NJ, NY, NEWFOUNDLAND, OH, ONT., QUE., RI, SD, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (132) NO_2 + NO_3 1.2 - 3.9; ORG. N 1.21 - 3.93; TOT. SOLIDS 193 - 240; Cl 16 - 36

(265) VERY COMMON NORTHERN, EASTERN, AND CENTRAL NORTH AMERICA. ADULTS OFTEN RANGE CONSIDERABLE DISTANCES FROM LARVAL HABITAT: ABLE TO COLONIZE SMALL AND TEMPORARY POOLS.

Limnephilidae *Nemotaulis hastilis* (Hagen)

	SOURCE	106	265	275	135	NOTES OR RANGES
	PARAMETERS					
	LARVAE	X		X		
	ADULT	X	X		X	
GENERAL HABITAT	LAKE/POND	X		X	X	(106) MARSH
	RIVER					
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER	X		X		LEAF OR TWIG PIECES
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT			X		STANDING WATERS
TEMP.	EUTHERMAL >30C					
	MESOTHERMAL 15-30C					
	OLIGOTHERMAL <15C					
	STENOTHERMAL <5C					
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0					
	ALKALIPHILOUS >=7.0					
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L					
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL					
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL					
	SEASONAL L			X		NOVEMBER
	DISTRIBUTION A	X	X			JUNE
GEOGRAPHIC DISTRIBUTION	REGION I	X		X		
	REGION II	X		X		
	REGION III					
	REGION IV					
	REGION V			X		
	REGION VI					
	REGION VII					
	REGION VIII			X		
	REGION IX					
	REGION X			X		

STATES AND PROVINCES MENTIONED: ALB., MI, MA, MN, MANIT., NH, NY, NEW FOUND., N.W. TERR, SASK., WI   BRITISH COLUMBIA AND OREGON TO NEWFOUNDLAND AND SOUTH TO NEW ENGLAND AND MICHIGAN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (135) COLLECTED IN LAKE WITH NO SUMMER DEFICIT OF O_2

Limnephilidae *Neophylax consimilis* Betten

	SOURCE		231	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	1 - 59
	CURRENT		X	4.0 - 4.2 FT/S
TEMP.	EUTHERMAL	>30C		1.7 - 20.5
	MESOTHERMAL	15-30C	X	
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0	X	5.6
	ALKALIPHILOUS	>=7.0	X	7.1
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L	X	7.7 - 11.8
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES		X	0.18 - 0.30
	NITRITES		X	0 - 0.005
	AMMONIA		X	0.21 - 0.64
	PHOSPHORUS	ORTHO	X	0.20 - 0.38
		TOTAL	X	0.25 - 0.45
	SEASONAL	L		
	DISTRIBUTION	A	X	JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV		X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: GA, NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: [231] SPEC. COND. 25.3 - 42; CO_2 10 - 20; SO_4 0 - 6; ELEVATION 579 - 610 METERS. SEEMED TO PREFER LARGER STREAMS.

Limnephilidae *Neophylax concinnus* (Vorhies)

	SOURCE	210	189	234	167	245	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X	X	X			
	ADULT	X			X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER			X	X		
	STREAM	X	X			X	
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC ON	X					
	EMBENTHIC IN						
	EPILITHIC ROCK	X					
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER	X					
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL >30C						0 - 24.5
	MESOTHERMAL 15-30C				X		
	OLIGOTHERMAL <15C				X		
	STENOTHERMAL <5C				X		
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0				X		7.0 - 8.2
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.				X		87 - 130
	MG/L						
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL		X		X		30 - 140
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS ORTHO						
	TOTAL						
	SEASONAL L	X					APRIL - AUGUST
	DISTRIBUTION A	X					APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II	X					
	REGION III		X				
	REGION IV		X				
	REGION V	X			X		
	REGION VI					X	
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: AR, L, KY, MI, NY, OH, ONT., VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (189, 167) TOT. HARDNESS as $CaCO_3$ 50 - 250; FREE CO_2 0.0 - 10.0; TOT. COLIFORMS 2- 323/100 ML; Cl 30 - 120; MEAN STREAM WIDTH 4 - 13 METERS

(234) FOUND ABOVE, BUT NOT BELOW, STUDY RESERVOIR

Limnephilidae *Neophylax fuscus* (Banks)

	SOURCE	210	13	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT	X		
GENERAL HABITAT	LAKE/POND			
	RIVER	X	X	
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	<25
	CURRENT			
TEMP.	EUTHERMAL >30C			13 - 28
	MESOTHERMAL 15-30C		X	
	OLIGOTHERMAL <15C		X	
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0		X	8.0 - 8.2
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.		X	90 - 91
	MG/L		X	7.2 - 9.6
H_2O CHEMISTRY	ALKALINITY PHTH.		X	0
	TOTAL		X	146 - 190
	NITRATES		X	0.2
	NITRITES		X	0.000 - <0.005
	AMMONIA		X	0.10 - 0.55
	PHOSPHORUS ORTHO		X	0.0
	TOTAL			
	SEASONAL L		X	FEBRUARY - JULY
	DISTRIBUTION A			
GEOGRAPHIC DISTRIBUTION	REGION I	X		
	REGION II			
	REGION III	X		
	REGION IV			
	REGION V	X		
	REGION VI			
	REGION VII	X	X	
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: MO, MI, NH, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (13) COLIFORMS 16 - 150; TOT. HARDNESS as $CaCO_3$ 158 - 194; DETERGENTS as ABS 0.2; Ca 82 - 87; Mg 76 - 107; Si 6.7; Fe 0.00; Mn 0.00; Na 1.7; K 0.8; SO_4 1.2; Cl 4.0; F 0.2

Limnephilidae *Neophylax mitchelli* Carpenter

	SOURCE PARAMETERS	231	NOTES OR RANGES
	LARVAE		
	ADULT	X	
GENERAL HABITAT	LAKE/POND		
	RIVER	X	
	STREAM		
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON		
	EMBENTHIC IN		
	EPILITHIC ROCK		
	EPIPHYTIC PLANT		
	OTHER		
HOME	RETREAT BUILDER		
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY	X	0 - 44
	CURRENT	X	1.8 FT/S
TEMP.	EUTHERMAL >30C		10.8 - 17
	MESOTHERMAL 15-30C	X	
	OLIGOTHERMAL <15C	X	
	STENOTHERMAL <5C		
PH	ACIDOBIONTIC <5.5		
	ACIDOPHILIC <7.0	X	6.8
	ALKALIPHILOUS >=7.0	X	7.1
	ALKALIBIONTIC >8.5		
DO	DISS. OXYGEN % SAT.		
	MG/L	X	8.9 - 9.4
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL		
	NITRATES	X	0.44 - 1.01
	NITRITES	X	0.003 - 0.01
	AMMONIA	X	0.21 - 0.50
	PHOSPHORUS ORTHO	X	0.20 - 0.38
	TOTAL	X	0.31 - 0.45
	SEASONAL L		
	DISTRIBUTION A	X	OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II		
	REGION III		
	REGION IV	X	
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX		
	REGION X		

STATES AND PROVINCES MENTIONED: GA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (231) SPEC. COND. 27.5 - 33; CO_3 10 - 20; SO_4 0 - 2; ELEVATION 310 METERS

Limnephilidae *Neophylax nacatus* (Denning)

	SOURCE / PARAMETERS	154	168	62	244	231	275	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	
	ADULT							
GENERAL HABITAT	LAKE/POND							
	RIVER					X		
	STREAM	X	X	X	X	X		
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN							
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER						X	ROCK FRA MENTS
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY					X		0 - 32
	CURRENT					X		1.48 - 2.8 FT/S
TEMP.	EUTHERMAL >30C							1 - 23.8
	MESOTHERMAL 15-30C			X		X		
	OLIGOTHERMAL <15C		X	X		X		
	STENOTHERMAL <5C		X			X		
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0	X			X	X		6.3
	ALKALIPHILOUS >=7.0					X		7.1
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.							
	MG/L				X	X		7.0 - 12
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL				X			2 - 4.5
	NITRATES	X				X		SEE COMMENTS
	NITRITES					X		0 - 0.008
	AMMONIA	X		X				SEE COMMENTS
	PHOSPHORUS ORTHO	X		X		X		SEE COMMENTS
	TOTAL					X		0.05 - 0.61
	SEASONAL DISTRIBUTION L	X	X			X		JAN. - DEC.
	A							
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV				X	X		
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: GA, NC, NEW BRUNS., ONT., QUE., SC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: [154] SUSP. SED. 0.78 - 0.91; REST IN MEQ/L Na 0.049 - 0.054; K 0.015; Ca 0.209 - 0.253; Mg 0.056 - 0.072; NH_4 0.003 - 0.004; HCO_3 0.187 - 0.235; SO_4 0.052 - 0.053; Cl 0.024 - 0.025; NO_3 0.007; H_2PO_4 < 0.001

[62, 244, 231] BOD 2.4; SUSP. SOLIDS 28; DISS. SOLIDS 27+; TOT. KJ. N 0.26; SPEC. COND. 6.8 - 20; PHTH. ACIDITY as $CaCO_3$ 2 - 3; TOT. HARDNESS as $CaCO_3$ 7 - 24; SO_4 50 - 8; TDS 13 - 41; NH_4 0 - 0.61

Limnephilidae *Neophylax occidentis* Banks

	SOURCE		5	10	275	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X		X	(5, 10) PUPAE
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM			X		
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON			X	
	EMBENTHIC	IN				
	EPILITHIC	ROCK			X	
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER				X	
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE				X	
	OMNIVORE					
	DETRITIVORE				X	
	TURBIDITY		X			0.2 - 3.6
	CURRENT		X			71 CM/S
TEMP.	EUTHERMAL	>30C				6 - 13.5
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C	X			
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0	X			7.3 - 7.6
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			53 - 58
	NITRATES		X			0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO	X			0.2 - 0.57
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X		APRIL - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX			X		
	REGION X			X	X	

STATES AND PROVINCES MENTIONED: CA, ID, NV, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM; MEAN WIDTH 30.5 M; SOILDS 90 - 114

(10) ELEVATION 1700 FT

Limnephilidae *Neophylax oligius* Ross

	SOURCE		167	265	231	NOTES OR RANGES
	PARAMETERS					
	LARVAE					
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	0 - 44
	CURRENT				X	1.8 FT/S
TEMP.	EUTHERMAL	>30C				0 - 24.5
	MESOTHERMAL	15-30C	X		X	
	OLIGOTHERMAL	<15C	X		X	
	STENOTHERMAL	<5C	X			
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0			X	5.6
	ALKALIPHILOUS	>=7.0	X		X	8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.	X			89 - 118
		MG/L			X	8.3 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			40 - 140
	NITRATES				X	0.31 - 1.01
	NITRITES				X	0.003 - 0.01
	AMMONIA				X	0.21 - 0.64
	PHOSPHORUS	ORTHO			X	0.20 - 0.38
		TOTAL			X	0.25 - 0.45
	SEASONAL	L				
	DISTRIBUTION	A		X	X	AUGUST - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV				X	
	REGION V		X			
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: GA, NEWFOUNDLAND, OH, SC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167, 231) FREE CO_2 0.0 - 10.0; TOT. HARDNESS as $CaCO_3$ 115 - 250; TOT. COLIFORMS 3 - 323/100 ML; SPEC. COND. 25.5 - 42; Cl 30 - 75; CO_3 10 - 20; MEAN STREAM WIDTH 4 - 13 METERS; ELEVATION 253 - 310 METERS

(231) MAY HAVE LOWER ELEVATION PREFERENCE THAN OTHER *Neophylax* SPECIES

Limnephilidae *Neophylax ornatus* Banks

	SOURCE PARAMETERS	168	244	275	231	NOTES OR RANGES
	LARVAE	X	X	X	X	
	ADULT				X	
GENERAL HABITAT	LAKE/POND				X	
	RIVER	X	X		X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON					
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT					
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	4 - 32
	CURRENT				X	1.8 - 2.0 FT/S
TEMP.	EUTHERMAL >30C					1 - 16
	MESOTHERMAL 15-30C		X		X	
	OLIGOTHERMAL <15C	X	X		X	
	STENOTHERMAL <5C	X			X	
PH	ACIDOBIONTIC <5.5					
	ACIDOPHILIC <7.0		X		X	6.3 - 6.9
	ALKALIPHILOUS >=7.0					
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L		X		X	7.0 - 10.6
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL		X			2 - 4.5
	NITRATES				X	0.35 - 0.53
	NITRITES				X	0 - 0.002
	AMMONIA				X	0.81 - 0.91
	PHOSPHORUS ORTHO				X	0.12
	TOTAL				X	0.20
	SEASONAL L	X			X	AUGUST - FEBRUARY
	DISTRIBUTION A				X	JULY
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV		X			
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: GA, NC, QUE., SC

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(244, 231) SPEC. COND. 8 - 29; PHTH. ACIDITY as $CaCO_3$ 2 - 5; TOT. HARDNESS 7 - 24; SO_4 ND - 5.8

(231) ELEVATION 567 - 960 METERS

Limnephilidae *Neothremna alicia* Banks

	SOURCE / PARAMETERS	246	2	10	122	1	275	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	
	ADULT			X				
GENERAL HABITAT	LAKE/POND							
	RIVER	X						
	STREAM		X	X	X	X	X	
	SPRING	X					X	
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN							
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER			X			X	SAND GRAINS
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE		X	X			X	
	TURBIDITY					X		1.0 - 2.3
	CURRENT	X				X		0.48 - 1.54 M/S
TEMP.	EUTHERMAL >30C							1 - 17
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C	X	X			X		
	STENOTHERMAL <5C	X				X		
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0	X				X		7.2 - 8.45
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.							
	MG/L	X						8.2 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL					X		114 - 174
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO							
	TOTAL							
	SEASONAL DISTRIBUTION L	X	X	X			X	APRIL - SEPTEMBER
	A							
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII	X	X	X	X	X	X	
	REGION IX						X	
	REGION X			X			X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, CO, MT, OR, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (1) OPTIMUM TOT. ALKALINITY = 114; TOT. HARDNESS as $CaCO_3$ 144 - 294, OPTIMUM = 144

(246) HCO_3 140 - 185; FREE CO_2 0 - 9

(122) MEAN TEMPERATURE IN WHICH 50% OF TEST ORGANISMS IN LAB EXPERIMENT DIED = 25.9 C AFTER 96 HOUR EXPOSURE

Limnephilidae *Oligophlebodes minuta* (Banks)

	SOURCE PARAMETERS		246	5	10	NOTES OR RANGES
	LARVAE		X			
	ADULT			X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER		X	X		
	STREAM				X	
	SPRING		X			
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER				X	
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE				X	
	TURBIDITY			X		0.2 - 3.6
	CURRENT		X	X		
TEMP.	EUTHERMAL	>30C				1 - 17
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C	X	X		
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0	X	X		7.2 - 8.1
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L	X			8.2 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		53 - 58
	NITRATES			X		0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO		X		0.2 - 0.57
		TOTAL				
	SEASONAL DISTRIBUTION	L	X			APRIL - SEPT
		A			X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI				X	
	REGION VII					
	REGION VIII		X		X	
	REGION IX					
	REGION X			X	X	

STATES AND PROVINCES MENTIONED: CO, OR, SD, UT, WY, NM

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (246) HCO_3 140 - 185; FREE CO_2 0 - 9 (5) SPEC. COND. 92 - 118; TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM; MEAN STREAM WIDTH 30.5 M

Limnephilidae *Oligophlebodes sierra* Ross

	SOURCE PARAMETERS		10	235	NOTES OR RANGES
	LARVAE			X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER			X	
	STREAM		X		
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER		X		
	FREELIVING				
DIET	CARNIVORE				(10) SCAVENGER
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	0.3 - 16 NTU
	CURRENT				
TEMP.	EUTHERMAL	>30C			2.6 - 19
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C		X	
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0		X	6.0
	ALKALIPHILOUS	>=7.0		X	8.2
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES			X	<0.05 - 0.17
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO		X	<0.02 - 0.05
		TOTAL		X	0.02 - 0.6
	SEASONAL	L			
	DISTRIBUTION	A	X		JUNE - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII		X		
	REGION IX		X		
	REGION X		X	X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, CO, MT, NV, OR, UT, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 101; TOT. KJ. N 0.03 - 0.19; TOT RESIDUE 55 - 102; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS as $CaCO_3$ 22 - 53; NON-CARBONATE HARDNESS 0 - 10; Si 9.2 - 42.8; Fe 0.05 - 0.71; Ca 6.2 - 16; Mg 1.5 - 6.0; Na 3.1 - 8.4; K 0.5 - 1.6; HCO_3 30 - 60; F 0 - 0.1; Cl 1 - 11; SO_4 3.0 - 12; B 0 - 0.06

Limnephilidae *Onocosmoecus unicolor* (Banks)

	SOURCE PARAMETERS	41	6	10																			NOTES OR RANGES
	LARVAE	X		X																			
	ADULT		X	X																			
GENERAL HABITAT	LAKE/POND			X																			
	RIVER	X		X																			
	STREAM		X	X																			
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER			X																			
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY																						
	CURRENT																						
TEMP.	EUTHERMAL >30C																						0 - 15
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C	X	X																				
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0	X																					5.9
	ALKALIPHILOUS >=7.0	X																					8.0
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL																						
	NITRATES																						
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL																						
	SEASONAL L																						
	DISTRIBUTION A		X																				OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X		X	X																			

STATES AND PROVINCES MENTIONED: N.W. TERR., OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M^3 HCO$_3$ 360 - 8100; SO$_4$ 70 - 340; Cl <10 - 300; N 9.2 - 9.8; P <0.05 - 3.4; Si 31 - 270; IN MOLES/M^3 Ca 0.17 - 2.2; Mg 0.07 - 0.79; Na 0.01 - 0.5; K 0.01 - 0.06; O$_2$ 0.04 - 0.37

(6) ELEVATION 500 FT

Limnephilidae *Pedomoecus sierra* Ross

	SOURCE PARAMETERS		5	10	275	NOTES OR RANGES
	LARVAE				X	
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER		X			
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER			X	X	ROCK FRAGMENTS
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			0.2 - 3.6
	CURRENT		X			71 CM/S
TEMP.	EUTHERMAL	>30C				6 - 13.5
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C	X			
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0	X			7.3 - 7.6
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			53 - 58
	NITRATES		X			0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO	X			0.2 - 0.57
		TOTAL				
	SEASONAL	L			X	SEPTEMBER
	DISTRIBUTION	A		X		JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX			X	X	
	REGION X		X	X		

STATES AND PROVINCES MENTIONED: BRIT. COL., ALB., CA, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8

(275) COLD RAPID STREAM: LOCAL AND NEVER NUMEROUS

	SOURCE		106	210	62	167	275	NOTES OR RANGES
	PARAMETERS							
	LARVAE		X	X	X		X	
	ADULT			X		X		
GENERAL HABITAT	LAKE/POND		X				X	MARSH ALSO
	RIVER			X		X		
	STREAM			X	X		X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON						
	EMBENTHIC	IN						
	EPILITHIC	ROCK						
	EPIPHYTIC	PLANT						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER						X	GRASSES AND SEDGES
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY				X			USUALLY <10
	CURRENT							
TEMP.	EUTHERMAL	>30C						0 - 24.5
	MESOTHERMAL	15-30C				X		
	OLIGOTHERMAL	<15C				X		
	STENOTHERMAL	<5C				X		
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0						
	ALKALIPHILOUS	>=7.0				X		7.0 - 8.2
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.					X	79 - 130
		MG/L						
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL					X	30 - 115
	NITRATES							
	NITRITES							
	AMMONIA					X		TRACE
	PHOSPHORUS	ORTHO				X		0.023 - 0.55
		TOTAL						
	SEASONAL	L					X	MAY
	DISTRIBUTION	A						
GEOGRAPHIC DISTRIBUTION	REGION I		X				X	
	REGION II		X					
	REGION III							
	REGION IV		X					
	REGION V		X	X		X		
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: GA, IL, IN, MI, MA, MN, MANIT., NH, NY, NC, NEWFOUND., OH, ONT., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 167) BOD 2.6; FREE CO_2 0.0 - 10.0; HARDNESS as $CaCO_3$ 110 - 250; TOT. COLIFORMS 1 - 323/100 ML; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; Cl 30 - 135

(275) COOL STREAMS TO WARM PONDS. ONE OF MOST TOLERANT OF ALL LIMNEPHILIDS TO WARM QUIET WATERS IN DENSE GROWTHS OF VEGETATION.

Limnephilidae *Pseudostenophylax edwardsi* (Banks)

	SOURCE PARAMETERS		7	10	235	9	269	275	NOTES OR RANGES
	LARVAE		X	X	X	X	X	X	
	ADULT		X	X			X		
GENERAL HABITAT	LAKE/POND								
	RIVER				X				
	STREAM		X	X			X	X	
	SPRING								
	TEMP. WATERS		X	X			X	X	
SPECIFIC HABITAT	EPIBENTHIC	ON	X	X				X	
	EMBENTHIC	IN						X	
	EPILITHIC	ROCK	X	X					
	EPIPHYTIC	PLANT	X	X					
	OTHER							X	SAND OR GRAVEL
HOME	RETREAT BUILDER								
	CASE MAKER		X	X			X	X	SMALL ROCK FRAGMENTS
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE		X			X			
	OMNIVORE								
	DETRITIVORE			X					
	TURBIDITY				X				0.6 - 23 NTU
	CURRENT								
TEMP.	EUTHERMAL	>30C							4.8 - 23
	MESOTHERMAL	15-30C	X		X				
	OLIGOTHERMAL	<15C	X		X	X			
	STENOTHERMAL	<5C			X				
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0			X				6.3
	ALKALIPHILOUS	>=7.0			X				8.2
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.							
		MG/L							
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL							
	NITRATES				X				0.05 - 0.18
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO			X				<0.02 - 0.03
		TOTAL			X				0.02 - 0.86
	SEASONAL	L		X			X	X	APRIL - JUNE
	DISTRIBUTION	A	X	X					MARCH - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V								
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX		X					X	
	REGION X		X		X		X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 36 - 118; TOT. KJ. N 0.05 - 0.22; TOT. RESIDUE 59.2 - 100.8; TOT. ORG. C 0.6 - 4.7; Ca-Mg HARDNESS as $CaCO_3$ 21 - 51; NON-CARBONATE HARDNESS as $CaCO_3$ 0 - 4; Si 9.1 - 47.6; Fe 0 - 0.63; Ca 6.0 - 14; Mg 1.4 - 3.9; Na 3.0 - 8.2; K 0.4 - 0.8; HCO_3 30 - 57; SO_4 3.0 - 9.0; F 0 - 0.6; Cl 1.2 - 8.5; B 0. ELEVATION 660 - 880 FT.

Limnephilidae *Pseudostenophylax uniformis* (Betten)

	SOURCE / PARAMETERS		105	168	275	231	NOTES OR RANGES
	LARVAE		X		X		
	ADULT		X			X	
GENERAL HABITAT	LAKE/POND		X				
	RIVER						
	STREAM			X	X	X	
	SPRING				X		
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON	X				
	EMBENTHIC	IN			X	X	
	EPILITHIC	ROCK	X				
	EPIPHYTIC	PLANT					
	OTHER				X	X	SAND OR GRAVEL
HOME	RETREAT BUILDER						
	CASE MAKER		X		X	X	SAND
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY					X	10 - 15
	CURRENT					X	1.8 FT/S
TEMP.	EUTHERMAL	>30C					2 - 16
	MESOTHERMAL	15-30C				X	
	OLIGOTHERMAL	<15C		X		X	
	STENOTHERMAL	<5C		X		X	
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0				X	6.5 - 6.8
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L				X	8.2 - 11.2
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES					X	0.13 - 0.53
	NITRITES					X	0.30 - 0.91
	AMMONIA					X	0.3 - 0.91
	PHOSPHORUS	ORTHO				X	0.12 - 0.27
		TOTAL				X	0.20 - 0.71
	SEASONAL	L					
	DISTRIBUTION	A				X	MARCH - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I		X		X		
	REGION II		X		X		
	REGION III				X		
	REGION IV		X		X	X	
	REGION V		X		X		
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, MA, ME, NH, NY, ONT., TN, QUE., MINNESOTA TO MAINE AND SOUTH TO TENNESSEE, GEORGIA, AND NORTH CAROLINA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (231) SPEC. COND. 9.2 - 11.9; CO_3 10 - 15; SO_4 0 - 5; ELEVATION 518 - 960 METERS

(168) WATER LEVEL SELDOM EXCEEDED 8 CM

Limnephilidae *Psychoglypha avigo* (Ross)

	SOURCE PARAMETERS		5	6	2 4 4	NOTES OR RANGES
	LARVAE		X		X	
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER		X		X	
	STREAM			X		
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY		X			0.2 - 3.6
	CURRENT		X			71 CM/S
TEMP.	EUTHERMAL	>30C				6 - 13.5
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C	X	X		
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0	X	X		7.0 - 7.6
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			53 - 58
	NITRATES		X			0.01 - 0.05
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO	X			0.2 - 0.57
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X		JUNE - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X		X	X	X	

STATES AND PROVINCES MENTIONED: OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN DEPTH 21.3 CM; MEAN STREAM WIDTH 30.5 M

(6) ELEVATION 700 FT

Limnephilidae *Psychoglypha bella* (Banks)

	SOURCE			NOTES OR RANGES
	PARAMETERS		6	
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		11.4
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	OCTOBER - NOV.
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X		X	

STATES AND PROVINCES MENTIONED: OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (6) ELEVATION 650 FT

Limnephilidae *Psychoglypha schmidt* Nimmo

	SOURCE		144	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND		X	
	RIVER			
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		3 - 9
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0		
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	SEPTEMBER - OCT.
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: ALBERTA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (144) EMERGENT TRAPS USED, TEMPERATURE OF WATER DURING EMERGENCE 5 - 6

Limnephilidae *Psychoglypha subborealis* (Banks)

	SOURCE	106	210	5	144	242	282	275	166	NOTES OR RANGES
	PARAMETERS									
	LARVAE	X		X		X	X	X	X	
	ADULT	X	X	X	X					
GENERAL HABITAT	LAKE/POND									
	RIVER			X						
	STREAM	X		X		X			X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON			X						(106) PUPAE IN SAND AND GRAVEL SUBSTRATE
	EMBENTHIC IN	X								
	EPILITHIC ROCK									
	EPIPHYTIC PLANT			X						
	OTHER	X								
HOME	RETREAT BUILDER									SAND PARTICLES & SOME ORGANIC MATTER
	CASE MAKER	X		X				X		
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY			X						0.2 - 3.6
	CURRENT			X						71 CM/S
TEMP.	EUTHERMAL >30C									0 - 17.5
	MESOTHERMAL 15-30C								X	
	OLIGOTHERMAL <15C			X	X				X	
	STENOTHERMAL <5C								X	
PH	ACIDOBIONTIC <5.5								X	4.6
	ACIDOPHILIC <7.0								X	
	ALKALIPHILOUS >=7.0			X						7.6
	ALKALIBIONTIC >8.5									
DO	DISS. OXYGEN % SAT.									
	MG/L									
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL			X						53 - 58
	NITRATES			X						0.01 - 0.05
	NITRITES									
	AMMONIA									
	PHOSPHORUS ORTHO			X						0.2 - 0.57
	TOTAL									
	SEASONAL L	X		X				X		FEB. - SEPT.
	DISTRIBUTION A	X		X	X					MAY - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I	X						X	X	
	REGION II	X								
	REGION III									
	REGION IV									
	REGION V	X						X		
	REGION VI									
	REGION VII									
	REGION VIII	X								
	REGION IX							X		
	REGION X	X			X	X		X		

STATES AND PROVINCES MENTIONED: AK, ALB., BRIT. COL., ME, MI, NH, NY, ONT., UT, WA MAINE TO ALASKA AND SOUTH TO CALIFORNIA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8. SMALL SIZE LARVAE FOUND CLOSER TO SHORE

(144) SPECIMENS COLLECTED WITH EMERGENT TRAPS, WATER TEMPERATURE DURING EMERGENCE 4.7 - 8.4 °C AND THROUGHOUT ENTIRE YEAR = 3 - 9 °C

Limnephilidae *Pycnopsyche apicalis* (Banks)

	SOURCE	168	NOTES OR RANGES
	PARAMETERS		
	LARVAE	X	
	ADULT		
GENERAL HABITAT	LAKE/POND		
	RIVER		
	STREAM	X	
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON	X	
	EMBENTHIC IN		
	EPILITHIC ROCK	X	
	EPIPHYTIC PLANT		
	OTHER		
HOME	RETREAT BUILDER		
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY		
	CURRENT		
TEMP.	EUTHERMAL >30C		
	MESOTHERMAL 15-30C		
	OLIGOTHERMAL <15C	X	
	STENOTHERMAL <5C	X	
PH	ACIDOBIONTIC <5.5		
	ACIDOPHILIC <7.0		
	ALKALIPHILOUS >=7.0		
	ALKALIBIONTIC >8.5		
DO	DISS. OXYGEN % SAT.		
	MG/L		
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL		
	NITRATES		
	NITRITES		
	AMMONIA		
	PHOSPHORUS ORTHO		
	TOTAL		
	SEASONAL L	X	JAN. - DEC.
	DISTRIBUTION A		
GEOGRAPHIC DISTRIBUTION	REGION I		
	REGION II		
	REGION III		
	REGION IV		
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX		
	REGION X		

STATES AND PROVINCES MENTIONED: QUEBEC

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Limnephilidae *Pycnopsyche circularis* (Provancher)

				NOTES OR RANGES
	SOURCE		166	
	PARAMETERS			
	LARVAE		X	
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		
	MESOTHERMAL	15-30C	X	0 - 17.5
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C	X	
PH	ACIDOBIONTIC	<5.5	X	
	ACIDOPHILIC	<7.0	X	4.6
	ALKALIPHILOUS	>=7.0		6.4
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L		
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL		
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL DISTRIBUTION	L		
		A		
GEOGRAPHIC DISTRIBUTION	REGION I		X	
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: NH

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Limnephilidae *Pycnopsyche divergens* (Walker)

	SOURCE		1057	1067	1066	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X			
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X			
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	[illegible]ITIVORE					
	[illegible]RBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				0 - 17.5
	MESOTHERMAL	15-30C			X	
	OLIGOTHERMAL	<15C			X	
	STENOTHERMAL	<5C			X	
PH	ACIDOBIONTIC	<5.5			X	4.6
	ACIDOPHILIC	<7.0			X	6.4
	ALKALIPHILOUS	>=7.0				
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.			X	ALMOST COMPLETE
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A				
GEOGRAPHIC DISTRIBUTION	REGION I		X		X	
	REGION II		X			
	REGION III					
	REGION IV					
	REGION V			X		
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED:MA, NH, NY, OH

ADDITIONAL WATER QUALITY DATA AND COMMENTS:

Limnephilidae *Pycnopsyche flavata* (Banks)

	SOURCE	244	231	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X		
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER		X	
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	8 - 59
	CURRENT		X	4.0 FT/S
TEMP.	EUTHERMAL >30C			2.5 - 20.5
	MESOTHERMAL 15-30C	X	X	
	OLIGOTHERMAL <15C	X	X	
	STENOTHERMAL <5C	X	X	
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0	X	X	5.9
	ALKALIPHILOUS >=7.0		X	7.0
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L	X	X	7.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		ND - 6.5
	NITRATES		X	0 - 0.28
	NITRITES		X	0.21 - 0.56
	AMMONIA		X	0.14 - 0.20
	PHOSPHORUS ORTHO		X	0.14 - 0.20
	TOTAL		X	0.22 - 0.25
	SEASONAL L			
	DISTRIBUTION A		X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV	X	X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244) SO_4 ND - 5.8; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; SPEC. COND. 8 - 51

(231) ELEVATION 736 - 823 METERS

Limnephilidae *Pycnopsyche gentilis* (McLachlan)

	SOURCE / PARAMETERS	106	168	283	244	169	166	231	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	X	
	ADULT						X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER							X	
	STREAM	X	X	X	X	X	X	X	
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON					X		X	
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT					X		X	
	OTHER							X	SAND
HOME	RETREAT BUILDER								
	CASE MAKER	X							LEAF FRAGMENTS
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE					X			
	TURBIDITY			X				X	- 44
	CURRENT							X	1.13 - 4.0
TEMP.	EUTHERMAL >30C								0 - 20.5
	MESOTHERMAL 15-30C			X	X		X	X	
	OLIGOTHERMAL <15C		X	X	X		X	X	
	STENOTHERMAL <5C		X		X		X		
PH	ACIDOBIONTIC <5.5						X		4.6
	ACIDOPHILIC <7.0			X	X		X	X	
	ALKALIPHILOUS >=7.0							X	7.1
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L			X	X			X	7.0 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL			X	X				ND - 10
	NITRATES							X	
	NITRITES							X	0 - 0.01
	AMMONIA							X	0 - 0.91
	PHOSPHORUS ORTHO							X	0.12 - 0.49
	TOTAL			X				X	0.00739 - 0.80
	SEASONAL L							X	APRIL - AUGUST
	DISTRIBUTION A							X	SEPT. - OCT.
GEOGRAPHIC DISTRIBUTION	REGION I	X					X		
	REGION II	X							
	REGION III	X							
	REGION IV	X		X	X			X	
	REGION V								
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: MA, ME, NC, NH, NY, PA, QUE., SC, VA NOVA SCOTIA TO GEORGIA THROUGH APPALACHIAN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 244, 231) SPEC. COND. 8 - 51; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; Mg 0.213 - 0.648; K 0.446 - 0.616; Na 0.763 - 1.125; SO_4 0 - 9; CO_3 5 - 20

(169) DISTRIBUTION CORRELATED WITH TEMPERATE DECIDUOUS FOREST BIOME. TENDED TO AVOID DEPOSITING SUBSTRATES IN EXPERIMENTAL SET UP, EXCEPT IN CASE MAKING INSTARS.

Limnephilidae *Pycnopsyche guttifer* (Walker)

	SOURCE / PARAMETERS		106	210	41	154	59	283	62	167	265	275	231	16	135	NOTES OR RANGES
	LARVAE		X	X	X	X	X	X	X			X	X			
	ADULT			X		X				X				X	X	
GENERAL HABITAT	LAKE/POND		X												X	COOL,GLACIAL
	RIVER				X								X			
	STREAM		X			X		X	X					X	X	
	SPRING															
	TEMP. WATERS															
SPECIFIC HABITAT	EPIBENTHIC	ON					X					X				
	EMBENTHIC	IN										X				
	EPILITHIC	ROCK														
	EPIPHYTIC	PLANT					X					X				
	OTHER											X				BURIED IN GRAVEL
HOME	RETREAT BUILDER															
	CASE MAKER															
	FREELIVING															
DIET	CARNIVORE															
	HERBIVORE															
	OMNIVORE															
	DETRITIVORE															
	TURBIDITY							X					X		X	0 - 59
	CURRENT															
TEMP.	EUTHERMAL	>30C														0 - 26
	MESOTHERMAL	15-30C			X		X						X	X	X	
	OLIGOTHERMAL	<15C			X		X						X	X	X	
	STENOTHERMAL	<5C					X						X	X	X	
PH	ACIDOBIONTIC	<5.5												X		4.6
	ACIDOPHILIC	<7.0				X	X						X	X	X	
	ALKALIPHILOUS	>=7.0			X								X			8.3
	ALKALIBIONTIC	>8.5														
DO	DISS. OXYGEN	% SAT.													X	66 - 95
		MG/L						X					X		X	6.7 - 13.8
H_2O CHEMISTRY	ALKALINITY	PHTH.													X	3.7 - 6.7
		TOTAL						X								10
	NITRATES												X		X	0 - 0.53
	NITRITES												X		X	0 - 0.005
	AMMONIA								X				X			0.21 - 0.56
	PHOSPHORUS	ORTHO							X				X		X	0.01 - 0.58
		TOTAL						X					X			0.00405 - 0.61
	SEASONAL	L										X	X			JAN - AUGUST
	DISTRIBUTION	A				X							X			JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			X										X		
	REGION II			X												
	REGION III															
	REGION IV		X	X				X					X			
	REGION V		X	X						X						
	REGION VI		X													
	REGION VII		X													
	REGION VIII		X	X									X			
	REGION IX															
	REGION X															

STATES AND PROVINCES MENTIONED: GA, IL, MI, NC, NH, NY, NOVA SCOTIA, NEW FOUND., N.W. TERR., OH, ONT., QUE., SASK., SD, TN. HUDSON BAY TO GEORGIA AND LOUISIANA AND WEST TO MONTANA AND WYOMING

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MOLES/M^3 Ca 0.63 - 1.0; Mg 0.23; Na 0.11 - 0.42; K 0.02 - 0.03; SO_4 0.22 - 0.51; Cl 0.01 - 0.07; HCO_3 0.70 - 2.6; IN MILLIMOLES/M^3 N 15 - 21; P 0.61 - 1.1; Si 24 - 69; Fe 3.0 - 6.0; Mn <1.0 - 1.0; Cu <1.0; Pb <1.0; As <1.0; Al <1.0; SUSP. SED. 12 - 150 G/M^3

(154) SUSP. SED. 0.95; REST IN MEQ/L Na 0.054; K 0.008; Ca 0.209; Mg 0.056; NH_4 0.004; HCO_3 0.187; SO_4 0.053; Cl 0.024; NO_3 0.007; H_2PO_4 <0.001

(283, 62, 231, 135) SPEC. COND. 8.7 - 40; BOD 2.6; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; Ca 0.470 - 1.077; Mg 0.213 - 0.648; K 0.431 - 0.616; Na 0.639 - 1.125; SO_4 0 - 8; CO_3 2 - 15; TOT. ORG. C 4 - 20

(135) COLLECTED IN LAKE THAT HAD NO SUMMER DEFICIT OF O_2

(59) NON-FEEDING, TERMINAL INSTAR LARVAE OVERWHELMING SELECTION FOR PEBBLES AROUND 16 MM. ESPECIALLY ABUNDANT AT THE STREAM MARGIN AMOUNG ORGANIC DEBRIS AND HIGHER AQUATIC PLANTS.

Limnephilidae *Pycnopsyche lepida* (Hagen)

	SOURCE / PARAMETERS		105	210	234	62	167	265	231	NOTES OR RANGES
	LARVAE		X	X	X	X				
	ADULT						X	X	X	
GENERAL HABITAT	LAKE/POND		X							
	RIVER				X		X		X	
	STREAM					X				
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON								
	EMBENTHIC	IN								
	EPILITHIC	ROCK								
	EPIPHYTIC	PLANT								
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER		X	X					X	SAND
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY					X			X	6 - 40
	CURRENT								X	SWIFT
TEMP.	EUTHERMAL	>30C								0 - 24.5
	MESOTHERMAL	15-30C					X		X	
	OLIGOTHERMAL	<15C					X		X	
	STENOTHERMAL	<5C					X			
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0							X	6.3
	ALKALIPHILOUS	>=7.0					X			8.2
	ALKALIBIONTIC	>8.5								
DO	DISS. OXYGEN	% SAT.					X			89 - 115
		MG/L							X	8.8 - 10.9
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL					X			40 - 123
	NITRATES								X	0.22 - 0.30
	NITRITES								X	0.0008 - 0.003
	AMMONIA					X			X	0.37 - 0.86
	PHOSPHORUS	ORTHO				X			X	0.27 - 0.40
		TOTAL							X	0.37 - 0.48
	SEASONAL	L								
	DISTRIBUTION	A						X	X	AUGUST - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II			X						
	REGION III			X						
	REGION IV		X					X	X	
	REGION V		X	X			X	X		
	REGION VI									
	REGION VII									
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: GA, IL, NC, NY, NEWFOUNDLAND, OH, ONT., PA, VA, WI. WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 167, 231) SPEC. COND. 9.5 - 11.5; BOD 2.6; SUSP. SOLIDS 28; DISS. SOLIDS 274; TOT. KJ. N 0.26; FREE CO_2 2.0 - 8.0; TOT. HARDNESS as $CaCO_3$ 115 - 230; TOT. COLIFORMS 323/100 ML; SO_4 0 - 2; CO_3 5 - 15; Cl 30 - 70; MEAN STREAM WIDTH 8 - 10 METERS

(234) FOUND ABOVE, BUT NOT BELOW STUDY RESERVOIR

Limnephilidae *Pycnopsyche luculenta* (Betten)

	SOURCE PARAMETERS	105	210	168	244	167	169	231	16	NOTES OR RANGES
	LARVAE	X	X	X	X		X		X	
	ADULT					X		X	X	
GENERAL HABITAT	LAKE/POND									
	RIVER							X		
	STREAM			X	X		X	X	X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON						X			
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT						X			
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER	X								
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY							X		1 - 44
	CURRENT									
TEMP.	EUTHERMAL >30C									0 - 22.5
	MESOTHERMAL 15-30C				X			X	X	
	OLIGOTHERMAL <15C			X	X			X	X	
	STENOTHERMAL <5C			X	X			X	X	
PH	ACIDOBIONTIC <5.5								X	4.6
	ACIDOPHILIC <7.0				X			X	X	
	ALKALIPHILOUS >=7.0							X		7.1
	ALKALIBIONTIC >8.5									
DO	DISS. OXYGEN % SAT.									
	MG/L				X			X		7.0 - 11.9
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL				X					ND - 6.5
	NITRATES							X		0 - 1.01
	NITRITES							X		0 - 0.1
	AMMONIA							X		0 - 0.91
	PHOSPHORUS ORTHO							X		0.10 - 0.58
	TOTAL							X		0.22 - 0.80
	SEASONAL L									
	DISTRIBUTION A							X		SEPT. - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I								X	
	REGION II		X							
	REGION III									
	REGION IV	X	X		X					
	REGION V	X	X			X		X		
	REGION VI									
	REGION VII									
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: GA, IL, NC, NY, OH, QUE. ONTARIO TO NORTH CAROLINA AND WEST TO WISCONSIN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244, 231) SPEC. COND. 8 - 51; CO_3 2 - 20; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; SO_4 ND - 5.8; ELEVATION 52 - 1067 METERS

(169) ASSOCIATED WITH TEMPERATE DECIDUOUS BIOME. IN EXPERIMENTAL SITUATION, AVOIDED DEPOSITING SUBSTRATES FOR MORE FIRM ONES.

Limnephilidae *Pycnopsyche scabripennis* (Rambur)

	SOURCE PARAMETERS	105	168	283	167	169	231	216	NOTES OR RANGES
	LARVAE	X	X	X		X	X	X	
	ADULT				X		X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER						X		
	STREAM		X	X		X	X	X	
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON					X			
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT					X			
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE					X			
	TURBIDITY			X			X		0 - 76
	CURRENT								
TEMP.	EUTHERMAL >30C								0 - 23
	MESOTHERMAL 15-30C			X			X	X	
	OLIGOTHERMAL <15C		X	X			X	X	
	STENOTHERMAL <5C		X	X			X	X	
PH	ACIDOBIONTIC <5.5							X	4.6
	ACIDOPHILIC <7.0			X			X	X	
	ALKALIPHILOUS >=7.0						X		7.5
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L			X			X		6.7 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL			X					10
	NITRATES						X		0.005 - 1.01
	NITRITES						X		0 - 0.01
	AMMONIA						X		0 - 1.07
	PHOSPHORUS ORTHO						X		0.1 - 0.58
	TOTAL						X		0.2 - 0.71 uG/L
	SEASONAL L						X		JANUARY - AUGUST
	DISTRIBUTION A						X		AUGUST - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I	X						X	
	REGION II	X							
	REGION III	X							
	REGION IV	X		X			X		
	REGION V	X			X				
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: AL, NC, OH. QUEBEC TO GEORGIA AND WEST TO MICHIGAN AND ILLINOIS

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 231) SPEC. COND. 8.7 - 33; SO_4 0 - 7.5; CO_3 2 - 70; Ca 0.470 - 1.077; Mg 0.213 - 0.648; Na 0.639 - 1.125; K 0.431 - 0.616 (169) ASSOCIATED WITH TEMPERATE DECIDUOUS BIOME. IN EXPERIMENTAL SITUATION, SHOWED PREFERENCE FOR BURROWING IN 4 - 16 MILLIMETER PEBBLES.

Limnephilidae ***Pycnopsyche sonso*** **(Milne)**

	SOURCE		105	244	231	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X	X	X	
	ADULT				X	
GENERAL HABITAT	LAKE/POND					
	RIVER				X	
	STREAM			X	X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X			
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT				X	1 - 59
TEMP.	EUTHERMAL	>30C				1.7 - 20.5
	MESOTHERMAL	15-30C		X	X	
	OLIGOTHERMAL	<15C		X	X	
	STENOTHERMAL	<5C		X	X	
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0		X	X	5.9
	ALKALIPHILOUS	>=7.0			X	7.3
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L		X	X	7.0 - 11.4
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL		X		ND - 6.5
	NITRATES				X	0.05 - 0.66
	NITRITES				X	0 - 0.006
	AMMONIA				X	0 - 0.91
	PHOSPHORUS	ORTHO			X	0.12 - 0.49
		TOTAL			X	0.22 - 0.80
	SEASONAL	L			X	JANUARY - AUGUST
	DISTRIBUTION	A			X	SEPT. - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV		X	X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: GA, NC, SC, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244, 231). SPEC. COND. 8 - 51; SO_4 0 - 9; CO_3 5 - 20; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28;

Limnephilidae *Pycnopsyche subfasciata* (Say)

	SOURCE		210	245	231	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X			
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND		X			
	RIVER		X		X	
	STREAM			X		
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER		X		X	SAND
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	1 - 32
	CURRENT				X	1.75 - 4.2 FT/S
TEMP.	EUTHERMAL	>30C				1.7 - 24
	MESOTHERMAL	15-30C			X	
	OLIGOTHERMAL	<15C			X	
	STENOTHERMAL	<5C			X	
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0			X	6.5
	ALKALIPHILOUS	>=7.0			X	7.3
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L			X	8.5 - 12.4
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES				X	0.13 - 0.53
	NITRITES				X	0 - 0.008
	AMMONIA				X	0.18 - 0.53
	PHOSPHORUS	ORTHO			X	0.10 - 0.58
		TOTAL			X	0.16 - 0.80
	SEASONAL	L	X			JUNE - SEPTEMBER
	DISTRIBUTION	A			X	SEPT. - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II		X			
	REGION III		X			
	REGION IV				X	
	REGION V		X			
	REGION VI			X		
	REGION VII					
	REGION VIII		X			
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: AR, GA, IL, MI, MN, NY, PA, SD, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (231) SPEC. COND. 9 - 32.5; SO_4 0 - 8; CO_3 5 - 20; ELEVATION 366 - 732 METERS

MOLANNIDAE

The hooded cases and distinctive hind tarsi make it easy to distinguish the larvae of this small family of caddisflies. There are only two genera of seven species found in North America. The larvae are restricted to lentic habitats or very slow moving sand-bottomed waters of rivers, streams, and springs. The larvae are apparently omniverous. We include minimal water quality profiles for only two species of the genus *Molanna*.

1. Genus *Molanna* Curtis

Larvae of this genus seem to be restricted to cooler waters of lakes or fairly cool, slow moving waters over gravel or sand. The larvae are able to bury themselves into the substrate for pupation and their sand cases are very hard to discern as the case with its hooded projection covers the entire larvae when viewed from above.

2. Genus *Molannodes* McLachlan

Only one species occurs in this genus in North America and the larvae are not known. In Europe and Asia the larvae are collected from lakes and from calm waters of slow rivers where the substrate consists of sand and/or sand, silt, and detritus.

Molannidae *Molanna blenda* Sibley

	SOURCE / PARAMETERS		210	168	167	275	232	135	NOTES OR RANGES
	LARVAE		X	X		X	X		
	ADULT		X		X			X	
GENERAL HABITAT	LAKE/POND								
	RIVER								
	STREAM			X			X	X	
	SPRING					X	X		
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC	ON				X	X		
	EMBENTHIC	IN							
	EPILITHIC	ROCK							
	EPIPHYTIC	PLANT							
	OTHER					X	X		SAND AND MUD
HOME	RETREAT BUILDER								
	CASE MAKER					X	X		ROCK FRAGMENTS
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE					X			
	DETRITIVORE								
	TURBIDITY						X	X	0 - 99
	CURRENT								
TEMP.	EUTHERMAL	>30C							0 - 26
	MESOTHERMAL	15-30C					X	X	
	OLIGOTHERMAL	<15C		X			X	X	
	STENOTHERMAL	<5C		X				X	
PH	ACIDOBIONTIC	<5.5					X		5.4
	ACIDOPHILIC	<7.0					X	X	6.9
	ALKALIPHILOUS	>=7.0							
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.						X	66 - 95
		MG/L					X	X	3.6 - 12.9
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL					X	X	3.7 - 60
	NITRATES						X	X	0.005 - 0.475
	NITRITES						X	X	0.0 - 0.11
	AMMONIA						X		0.15 - 0.72
	PHOSPHORUS	ORTHO					X	X	0.01 - 0.48
		TOTAL					X		0.40 - 0.48
	SEASONAL	L							
	DISTRIBUTION	A					X		APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II		X						
	REGION III								
	REGION IV						X		
	REGION V		X		X				
	REGION VI								
	REGION VII								
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: GA, IL, NY, OH, QUE., TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (232) SO_4 0.0 - 7.5

(135) TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; TOT. ORG. C 4 - 20; NO_2 + NO_3 0 - 0.1; SPEC. COND. 17 - 40

(275) CONFINED TO SMALL COLD SPRINGS

(232) EMERGENCE PROBABLY THROUGHOUT MOST OF THE YEAR

Molannidae *Molanna tryphena* Betten

	SOURCE		210	232	NOTES OR RANGES
	PARAMETERS				
	LARVAE			X	
	ADULT		X	X	
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON		X	
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER			X	SAND
HOME	RETREAT BUILDER				
	CASE MAKER			X	SAND GRAINS
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	8 - 31
	CURRENT				12 - 19
TEMP.	EUTHERMAL	>30C			
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			6.1
	ACIDOPHILIC	<7.0		X	7.0
	ALKALIPHILOUS	>=7.0		X	
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL		X	20 - 60
	NITRATES			X	0.005 - 0.475
	NITRITES			X	0.0 - 0.11
	AMMONIA			X	0.25 - 0.72
	PHOSPHORUS	ORTHO		X	0.27 - 0.50
		TOTAL		X	0.29 - 0.55
	SEASONAL DISTRIBUTION	L			
		A		X	APRIL
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II		X		
	REGION III				
	REGION IV			X	
	REGION V		X		
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: GA, MI, NY, TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (232) SO_4 0.0 - 10.5

ODONTOCERIDAE

This family is represented in North America by fourteen species belonging to six genera. We include profiles for four species of three genera. Members of this family are quite local in distribution and are restricted to lotic waters. Larvae are for the most part, burrowers and may be collected from deposits of gravel, sand or silt. Their cases are of sand grains or small stones curved and tapered. At times, pupae of *Psilotreta* can be found in large numbers on the underside of rocks. With the exception of *Marilia*, the family appears to be restricted to cool, highly oxygenated waters.

1. Genus *Marilia* Müller

Only two species, *M. nobsca* Milne and *M. flexulosa* Ulmer, are known from the United States. Larvae are primarily in small streams in the southwest, although they are reported from Ontario. We have no water data for members of this genus.

2. Genus *Namamyia* Banks

Positive larval association is not made for this genus, though larvae thought to be of *N. plutonis* have been collected from Oregon and California. The larvae are taken from gravel substrates in cool streams. We have no water data for this genus.

3. Genus *Nerophilis* Banks

N. californicus (Hagen) is the sole member of this genus. It is reported only from California and Oregon where it is collected from sand and silt deposits in cool streams. We include a minimal profile for this species.

4. Genus *Parthina* Denning

Two western species, *P. linea* Denning and *P. vierra* Denning are the sole representatives of this genus. They are collected from cold springs. Notes on the restricted habitat and distribution are the only water data available for these species.

5. Genus *Pseudogoera* Carpenter

One species, *P. singularis* Carpenter, is the sole member of this genus. Larvae are collected from moss growing on rocks below small waterfalls in Region IV. Larvae are restricted to small, cold streams. We include a minimal profile for this species.

6. Genus *Psilotreta* Banks

Only one of the seven North American species of this genus is described though we include data for two species based on associated material. Larvae frequently pupate enmasse beneath rocks. The genus is restricted to cool, lotic habitats.

Odontoceridae *Nerophilus californicus* (Hagen)

	SOURCE	6	275	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT	X		
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM	X	X	
	SPRING			
	TEMP. WATERS	X		
SPECIFIC HABITAT	EPIBENTHIC ON	X		
	EMBENTHIC IN	X	X	
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER	X	X	MUD. SAND. SILT
HOME	RETREAT BUILDER			
	CASE MAKER	X	X	SAND GRAINS
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE		X	
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL >30C			11.4
	MESOTHERMAL 15-30C			
	OLIGOTHERMAL <15C	X	X	(275) COOL
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		APPROX. 7.0
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL			
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO			
	TOTAL			
	SEASONAL L		X	APRIL
	DISTRIBUTION A	X		JUNE
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX		X	
	REGION X	X	X	

STATES AND PROVINCES MENTIONED:CA, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(6) ELEVATION 650 FT. HARDNESS = SOFT WATER

Odontoceridae *Pseudogoera singularis* Carpenter

	SOURCE PARAMETERS	283	250	275	NOTES OR RANGES
	LARVAE	X	X	X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM	X	X	X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN		X	X	
	EPILITHIC ROCK				
	EPIPHYTIC PLANT		X	X	
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER			X	ROCK FRAGMENTS
	FREELIVING				
DIET	CARNIVORE			X	
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE			X	
	TURBIDITY	X	X		0 - 51
	CURRENT				
TEMP.	EUTHERMAL >30C				2 - 23
	MESOTHERMAL 15-30C	X	X		
	OLIGOTHERMAL <15C	X	X		
	STENOTHERMAL <5C	X	X		
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0	X	X		6.6
	ALKALIPHILOUS >=7.0		X		7.5
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L	X	X		8 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL	X	X		10 - 40
	NITRATES		X		0.05 - 1.0
	NITRITES		X		<0.001 - 0.006
	AMMONIA				
	PHOSPHORUS ORTHO				
	TOTAL	X	X		4.05 - 640 uG/L
	SEASONAL L			X	MAY
	DISTRIBUTION A		X		OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV	X	X	X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: GA, NC, SC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 250) SPEC. COND. 8.7 - 25; SO_4 0 - 3; Ca 0.470 - 1.077; Mg 0.213 - 0.648; K 0.431 - 0.616; Na 0.639 - 1.125
(275) OFTEN ASSOCIATED WITH SMALL WATERFALLS

Odontoceridae *Psilotreta indecisa* (Walker)

	SOURCE / PARAMETERS	167	141	NOTES OR RANGES
	LARVAE		X	
	ADULT	X	X	
GENERAL HABITAT	LAKE/POND			
	RIVER	X	X	
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT		X	0.26 - 2.29 FT/S
TEMP.	EUTHERMAL >30C			0 - 24.5
	MESOTHERMAL 15-30C	X		
	OLIGOTHERMAL <15C	X		
	STENOTHERMAL <5C	X		
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		7.0 - 8.2
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.	X		89 - 115
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		40 - 123
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO			
	TOTAL			
	SEASONAL L			
	DISTRIBUTION A			
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V	X	X	
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: OH, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0 - 8.5; HARDNESS as $CaCO_3$ 115 - 240; Cl 30 - 75; MEAN WIDTH 4 - 10 METERS
(141) SITE FLOW SEVERELY AFFECTED BY HYDROELECTRIC DAM UPSTREAM.

Odontoceridae *Psilotreta rossi*

	SOURCE		244	248	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X		
	ADULT			X	
GENERAL HABITAT	LAKE/POND				
	RIVER				
	STREAM				
	SPRING		X	X	
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			5 - 15
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0	X		6.3 - 6.9
	ALKALIPHILOUS	>=7.0			
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L	X		8.8 - 10.6
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL	X		2.2 - 4.5
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL	L			
	DISTRIBUTION	A		X	JUNE
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV		X	X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED:NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(244) SPEC. COND. 8 - 20; PHTH. ACIDITY as $CaCO_3$ 2 - 5; TOT. HARDNESS as $CaCO_3$ 7 - 24; SO_4 ND - 5.8

PHILOPOTAMIDAE

This net spinning family is represented by three genera and forty species in the United States. The sack-like larval nets are extremely fine and the larvae feed by brushing fine particulate matter from the net with their t-shaped labrum. Larvae are restricted to areas of slow current in rivers and streams. Larvae are poorly known with only eight having been described. We include profiles for four species.

1. Genus *Chimarra* Stephens

The larvae of five species belonging to this genus, which has approximately 17 species in the United States, are described. We include data on two of them. The genus is restricted to lotic habitats and frequently inhabits warmer, slow moving rivers and streams.

2. Genus *Dolophilodes* Ulmer

There are eight species of this genus known north of Mexico. They are restricted to lotic habitats and are quite often collected near the headwaters of small streams. The adults of one species, *D. distinctus* (Walker), are often times brachypterous, especially during the colder months. The larvae of this species is the only North American representative of this genus that is described. We include a profile for this species.

3. Genus *Wormaldia* McLachlan

This genus has thirteen species in the United States, most of which are western. The larvae of two eastern species are described. We include a profile for one of these, *W. moesta* (Banks). The larvae are known from spring fed brooks and relatively clear, cool rivers and streams.

Philopotamidae *Chimarra aterrima* (Hagen)

	SOURCE	210	36	66	12	13	113	146	141	189	234	157	62	25	167	277	245	275	135				NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X			X	X	X	X	X				X	X		X		X					
	ADULT	X	X	X					X			X			X	X	X		X				
GENERAL HABITAT	LAKE/POND																						
	RIVER				X	X	X		X		X	X		X	X		X						
	STREAM									X		X	X	X		X	X		X				
	SPRING	X																					
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON								X					X				X					
	EMBENTHIC IN																						
	EPILITHIC ROCK								X									X					
	EPIPHYTIC PLANT													X				X					
	OTHER								X														SAND
HOME	RETREAT BUILDER	X												X				X					
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																	X					
	DETRITIVORE																						
	TURBIDITY					X	X												X				0.5 - 4.9
	CURRENT								X							X							0.05 - 2.51 FT/S
TEMP.	EUTHERMAL >30C																						0 - 26
	MESOTHERMAL 15-30C					X	X							X	X				X				
	OLIGOTHERMAL <15C					X	X								X				X				
	STENOTHERMAL <5C														X				X				
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0						X								X				X				5.9
	ALKALIPHILOUS >=7.0					X		X															8.3
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.					X	X								X				X				66 - 130
	MG/L				X	X	X	X											X				6.5 - 13.4
H_2O CHEMISTRY	ALKALINITY PHTH.					X													X				0 - 6.7
	TOTAL					X	X	X							X								3.2 - 228
	NITRATES					X	X	X											X				0.1 - 0.6
	NITRITES					X	X												X				0.000 - <0.005
	AMMONIA					X	X	X															<0.1 - 0.7
	PHOSPHORUS ORTHO					X		X					X						X				0.0 - 0.55
	TOTAL				X		X	X															0.03 - 0.24
	SEASONAL L				X	X	X		X					X		X							JAN. - DEC.
	DISTRIBUTION A	X	X	X					X			X				X	X						MARCH - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I	X	X		X		X																
	REGION II	X		X																			
	REGION III	X								X													
	REGION IV	X								X				X									
	REGION V	X							X		X				X								
	REGION VI	X															X						
	REGION VII					X		X															
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, FL, IL, IN, KY, MA, ME, MN, MO, NC, NH, NY, NOVA SCOTIA, ON, ONT., PA, QUE., TN, VA, WV, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (12, 13, 113, 146, 62, 167, 135) SPEC. COND. 42 - 425; BOD 1.5 - 3.0; COD 2 - 38; DETERGENTS as ABS 0.1; TOT. HARDNESS as $CaCO_3$ 9 - 250; Ca HARDNESS as $CaCO_3$ 37.6 - 39.2; TOT. ORG. C 4 - 20; TOT. COLIFORMS 2 - 400/1-0 ML; SUSP. SOLIDS 28; DISS. SOLIDS 274; FREE CO_2 0.01 - 10.0; TOT. KJ. N 0.26; Ca 82 - 116; Mg 61 109; Si 4.4 - 7.3; Fe 0 - 0.26; Mn 0.00 - 0.38; Na 1.0 - 2.4; K 0.8; SO_4 0.2 - 14; Cl 2.0 - 120; F 0.04 - 0.7; Cd 0.003 - 0.01; Pb 0.03 - 0.035; Zn 0.01 - 0.09; Ni 0.02 - 0.63; Cu 0.01; Al 0.005 - 0.05; Cr 0.003

(189) FOUND IN STREAMS WITH BOTH RELATIVELY HIGH AND LOW NUTRIENT CONCENTRATIONS

(277) STATISTICALLY SHOWED PREFERENCE FOR: SUBSTRATE STONES GREATER 5 CM DIAMETER; HIGH MOSS VOLUME; CURRENT 20 - 40 CM/S; AND DEPTHS GREATER THAN 10 CM

(141) CURRENT AND FLOW AFFECTED BY UPSTREAM HYDROELECTRIC DAM

(12) CLASSIFIED AS SENSITIVE TO POLLUTION

(234) FOUND BOTH ABOVE AND BELOW RESERVOIR UNDER STUDY

Philopotamidae *Chimarra obscura* (Walker)

	SOURCE PARAMETERS	210	36	41	13	98	113	132	146	141	148	171	189	234	157	244	167	245	114				NOTES OR RANGES
	LARVAE	X		X	X	X	X	X	X	X	X					X			X				
	ADULT	X	X							X					X		X	X					
GENERAL HABITAT	LAKE/POND																						
	RIVER			X	X	X	X	X-		X	X				X		X	X	X				
	STREAM	X										X	X			X		X					
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON									X													
	EMBENTHIC IN																						
	EPILITHIC ROCK									X													
	EPIPHYTIC PLANT																						
	OTHER									X													SAND
HOME	RETREAT BUILDER	X																					
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY				X	X	X				X								X				2.1 - 51
	CURRENT									X													0.17 - 1.28 FT/S
TEMP.	EUTHERMAL >30C					X																	0 - 31
	MESOTHERMAL 15-30C			X	X	X	X	X								X	X		X				
	OLIGOTHERMAL <15C			X	X	X	X				X	X				X	X		X				
	STENOTHERMAL <5C			X	X	X											X						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0			X			X									X			X				5.9
	ALKALIPHILOUS >=7.0			X	X	X	X		X		X	X					X		X				
	ALKALIBIONTIC >8.5				X																		8.9
DO	DISS. OXYGEN % SAT.				X	X	X										X		X				62 - 158
	MG/L				X	X	X	X	X		X	X				X			X				3.5 - 14.8
H_2O CHEMISTRY	ALKALINITY PHTH.				X	X																	0 - 8
	TOTAL				X	X	X		X		X					X	X		X				2 - 232
	NITRATES				X	X		X	X		X								X				<0.1 - 3.6
	NITRITES				X	X	X	X															0.000 - 0.085
	AMMONIA				X	X	X	X	X										X				0.01 - 5.5
	PHOSPHORUS ORTHO				X	X		X	X		X												0.0 - 2.6
	TOTAL						X	X	X										X				0.06 - 4.44
	SEASONAL L				X	X	X	X		X	X												JAN. - DEC.
	DISTRIBUTION A		X							X					X			X					APRIL - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I	X	X				X												X				
	REGION II	X																					
	REGION III	X											X										
	REGION IV	X											X			X							
	REGION V	X						X		X	X	X					X						
	REGION VI	X																X					
	REGION VII	X			X	X			X														
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, IL, IN, KY, MA, ME, MD, MI, MN, MO, NC, NH, NY, N.W. TERR., OH, OK, ONT., PA, TX, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) IN MILLIMOLES/M^3 HCO_3 560 - 8100; SO_4 70 - 340; Cl LESS THAN 10 - 300; N 9.2 - 9.8; P LESS THAN 0.05 - 3.4; Si 31 - 270; IN MOLES/M^3 Ca 0.17 - 2.2; Mg 0.07 - 0.79; Na 0.01 - 0.5; K 0.01 - 0.06; O_2 0.04 - 0.37

(13, 98, 113, 132, 146, 148, 244, 167, 114) SPEC. COND. 8 - 1250; COLIFORMS 2 - 2300 PER 100 ML; FECAL STREPTOCOCCI LESS THAN 2 - 410/100 ML; TOT. HARDNESS as $CaCO_3$ 8 - 298; Ca HARDNESS as $CaCO_3$ 31.2 - 195; Mg HARDNESS as $CaCO_3$ 2 - 51; DETERGENTS as ABS 0.0 - 0.6; PHTH. ACIDITY 2 - 5; FREE CO_2 0.0 - 10.0; COLOR 0 - 10; BOD 7 - 36; COD 0 - 86; TOT. SOLIDS 178 - 193; ORGANIC N 0.55 - 1.21; Si 0.0 -12.6; SO_4 0 - 50; Cl 2.8 - 120; Fe 0.0 - 2.0; Mn 0.0 - 0.5 ; Na 0.7 - 52.8; K 0.9 - 4.9; F 0.0 - 1.4; Cd 0.005 - 0.02; Pb 0.025 ; 0.200; Zn 0.01 - 0.09; Ni 0.02 - 0.11; Cu 0.005 - 0.02; Al 0.005 - 0.05; Cr 0.003 - 0.008

(171) LC_{50} OF 3-TRIFLUROMETHYL-4-NITROPHENOL (TFM) AT 24 HR. = 3.8 MG/L, AT 96 HR. = 2.8 MG/L

(141) FLOW AFFECTED BY HYDROELECTRIC DAM UPSTREAM

Philopotamidae *Dolophilodes distinctus* (Walker)

	SOURCE	210	36	154	143	239	62	265	275	240	114	141	135										NOTES OR RANGES
	PARAMETERS																						
	LARVAE			X	X	X	X		X	X	X	X											
	ADULT	X	X									X	X										
GENERAL HABITAT	LAKE/POND																						
	RIVER								X		X	X											
	STREAM			X	X	X	X			X			X										
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON								X			X											
	EMBENTHIC IN																						
	EPILITHIC ROCK								X			X											
	EPIPHYTIC PLANT																						
	OTHER											X											SAND
HOME	RETREAT BUILDER	X							X														
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY						X				X		X										0.5 - 7.2
	CURRENT											X											0.56 - 1.76 FT/S
TEMP.	EUTHERMAL >30C																						0 - 26
	MESOTHERMAL 15-30C										X		X										
	OLIGOTHERMAL <15C				X						X		X										
	STENOTHERMAL <5C												X										
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0			X						X	X		X										5.9
	ALKALIPHILOUS >=7.0				X						X												8.0
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.										X		X										66 - 105
	MG/L				X						X		X										6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.									X			X										0.0 - 6.7
	TOTAL				X					X	X												2.9 - 125
	NITRATES			X	X						X		X										0 - 0.5
	NITRITES				X								X										<0.01
	AMMONIA			X	X		X				X												0 - 0.3
	PHOSPHORUS ORTHO			X	X		X						X										<0.001 - 0.55
	TOTAL				X						X												<0.01 - 0.25
	SEASONAL L			X	X	X	X		X	X	X	X											JAN. - DEC.
	DISTRIBUTION A	X	X									X	X										JAN. - DEC.
GEOGRAPHIC DISTRIBUTION	REGION I	X	X						X		X												
	REGION II								X														
	REGION III	X							X														
	REGION IV	X							X	X													
	REGION V	X			X				X			X											
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: GA, IN, MA, MI, MN, NC, NH, NEW BRUNS., NEW FOUND., NOVA SCOTIA, ONT., PA, QUE., TN, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154, 143, 62, 240, 114, 135) SPEC. COND. 17 - 60; SUSP. SED. 0 - 7.0; HARDNESS as $CaCO_3$ 9.0 - 140; COLIFORMS LESS THAN 100 TO 57000/100 ML; FECAL COLIFORMS LESS THAN 10 TO 720/100 ML; BOD 0.2 - 2.6; TOT. KJ. N 0.26; ORGANIC N 0.1 - 0.6; DISS. SOLIDS 274; Na 0.049; SO_4 0.052 - 10; Cl 0.025 - 4.9; Fe 0.03 - 0.25; K 0.008; Ca 0.253; Mg 0.072; HCO_3 0.235; TOT. ORG. C 4 - 20; CO_2 3.5

(210, 275) WINGLESS FEMALES MAY EMERGE IN WINTER MONTHS

(265) WIDESPREAD AND COMMON IN EASTERN AND CENTRAL NORTH AMERICA FROM NOVA SCOTIA TO NORTH CAROLINA AND WEST TO MINNESOTA

Philopotamidae *Wormaldia moesta* (Banks)

	SOURCE / PARAMETERS	36	41	154	146	167	166	210	NOTES OR RANGES
	LARVAE			X	X		X	X	
	ADULT	X				X	X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER		X			X		X	
	STREAM						X		
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE								
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY								
	CURRENT								
TEMP.	EUTHERMAL >30C								0 - 22
	MESOTHERMAL 15-30C		X				X		
	OLIGOTHERMAL <15C		X				X		
	STENOTHERMAL <5C		X				X		
PH	ACIDOBIONTIC <5.5						X		4.6
	ACIDOPHILIC <7.0		X	X			X		
	ALKALIPHILOUS >=7.0		X		X				8.4
	ALKALIBIONTIC >8.5								
DO	DISS. OXYGEN % SAT.								
	MG/L				X				10.9
H$_2$O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL				X				170
	NITRATES			X	X				0.007 - 0.6
	NITRITES								
	AMMONIA			X	X				0.003
	PHOSPHORUS ORTHO			X	X				0.001 - 0.03
	TOTAL				X				0.05
	SEASONAL L			X					JUNE - SEPT.
	DISTRIBUTION A	X						X	MARCH - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I	X					X		
	REGION II							X	
	REGION III							X	
	REGION IV							X	
	REGION V					X		X	
	REGION VI								
	REGION VII			X					
	REGION VIII								
	REGION IX								
	REGION X								

STATES AND PROVINCES MENTIONED: GA, IL, IN, MO, NH, NC, N.W. TERR., OH, ONT., TN, VA, WV, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M^3 Ca 170 - 3800; Mg 70 - 2100; Na 10 - 5200; K 10 - 6-; SO$_4$ 70 - 2200; HCO$_3$ 880 - 8100; Cl LESS THAN 10 - 300; n 9.2-- 98; Si 31 - 270; Fe 0.20 - 16; Mn LESS THAN 0.10 - 1.7; Zn 0.02 - 0.40; Cu LESS THAN 0.03 - 0.47; Pb LESS THAN 0.01 - 0.02; Cd LESS THAN 0.01 - 0.01

(154, 146) SUSP. SED. 0.78; SPEC. COND. 370; TOT. HARDNESS as CaCO$_3$ 184; Ca HARDNESS as CaCO$_3$ 39.2; Na 0.049 - 1.0; K 0.008 - 1.5; Ca 0.253; Mg 0.072; HCO$_3$ 0.235; SO$_4$ 0.052 - 14; Cl 0.025 - 9; F 0.67; Mn LESS THAN 1.0; Si 4.5; COD 2

PHRYGANEIDAE

This tube case making family contains some of the largest and most colorful caddisfiles in North America. Larvae of this family have been collected in a wide variety of habitats from shallow streams to lakes up to 100 meters deep. They are primarily restricted to quiet waters or pools when found in lotic habitats. There are nine genera with twenty-seven known species in North America. We include water quality data for eight species. Most larvae are at least partially predacious during later instars.

1. Genus *Agrypnia* Curtis

There are nine species of this genus in North America. The larvae of four have been described. The genus is mostly northern in distribution. Larvae are found primarily in slow moving waters or rivers or streams or lentic habitats. The tube case is constructed of spirally arranged leaf and bark pieces. We include some water quality data on three species.

2. Genus *Banksiola* Martynov

Five, primarily eastern, species of this genus are known from the United States. Larvae are known for three of these species, and we include data on one, *B. crotchi* Banks. The larvae are often found in marsh habitats with a large amount of organic matter and very slow moving or calm waters. The larvae of this genus have very distinctive colored bands on their meso- and metanotum.

3. Genus *Fabria* Milne

There are two species assigned to this genus in North America. The larvae of only one, *F. inornata* (Banks), is known. It has been collected in lentic habitats from mats of *Ceratophyllum* and *Potamogeton*. We have no water quality data for this genus.

4. Genus *Hagenella* Martynov

No larvae have definitely been associated in North America for this genus. It has only one representative, *H. canadensis* (Banks), known from the United States. We have no water quality data for this genus.

5. Genus Oligostomis Kolenati

Two northeastern species of this genus are known from the United States. We include a minimal profile for O. paradalis (Walker). Larvae occur in small, cool streams in deciduous forests. The adults of this genus are among the most strikingly colored caddisflies.

6. Genus Oligotrichia Rambur

Only one representative of this genus, O. lapponica (Hagen), occurs in North America. It is limited in distribution to Region X and is only known from western Alaska. We have no water quality data available for this genus.

7. Genus Phryganea Linnaeus

There are two species of this genus known from the United States. We include minimal water quality data on P. cinerea Walker. The larvae inhabit marshes and lake bottoms and make spiral plant cases. No characters are known to distinguish the larvae of P. cinerea from P. sayi Milne.

8. Genus Ptilostomis Kolenati

Larvae for all four North American species of this genus are known, but diagnostic characters are not found to separate the species. P. ocellifera is described, and we include a profile for this species. Larvae are known primarily from quiet water habitats and are collected in springs, rivers, streams, and temporary pools. Three of the four species are northern in distribution with only P. postica (Walker) being recorded as far south as Region IV.

9. Genus Yphria Milne

This monotypic, largely predaceous genus is represented by Y. californica Banks. It is known from small, western rivers and streams where it is found among the accumulated detritus. We include minimal water quality data for this species.

Phryganeidae *Agrypnia colorata* (Hagen)

	SOURCE		41	193	265	217																		NOTES OR RANGES
	PARAMETERS																							
	LARVAE																							
	ADULT			X	X	X																		
GENERAL HABITAT	LAKE/POND																							
	RIVER		X																					
	STREAM																							
	SPRING																							
	TEMP. WATERS																							
SPECIFIC HABITAT	EPIBENTHIC	ON																						
	EMBENTHIC	IN																						
	EPILITHIC	ROCK																						
	EPIPHYTIC	PLANT																						
	OTHER																							
HOME	RETREAT BUILDER																							
	CASE MAKER																							
	FREELIVING																							
DIET	CARNIVORE																							
	HERBIVORE																							
	OMNIVORE																							
	DETRITIVORE																							
	TURBIDITY																							
	CURRENT																							
TEMP.	EUTHERMAL	>30C																						0 - 17
	MESOTHERMAL	15-30C																						
	OLIGOTHERMAL	<15C	X																					
	STENOTHERMAL	<5C																						
PH	ACIDOBIONTIC	<5.5																						
	ACIDOPHILIC	<7.0																						
	ALKALIPHILOUS	>=7.0	X																					7.5 - 8.2
	ALKALIBIONTIC	>8.5																						
DO	DISS. OXYGEN	% SAT.																						
		MG/L																						
H_2O CHEMISTRY	ALKALINITY	PHTH.																						
		TOTAL																						
	NITRATES																							
	NITRITES																							
	AMMONIA																							
	PHOSPHORUS	ORTHO																						
		TOTAL																						
	SEASONAL	L																						
	DISTRIBUTION	A		X	X																			MAY - JULY
GEOGRAPHIC DISTRIBUTION	REGION I																							
	REGION II																							
	REGION III																							
	REGION IV																							
	REGION V																							
	REGION VI																							
	REGION VII																							
	REGION VIII																							
	REGION IX																							
	REGION X																							

STATES AND PROVINCES MENTIONED: BRIT. COL., N.W. TERR., NEW FOUND., SASK.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (265) TRANSCONTINENTAL IN NORTHERN AND MONTANE AREAS

Phryganeidae *Agr nia improba* (Hagen)

	SOURCE / PARAMETERS	36	41	193	265	264	217	275	135	NOTES OR RANGES
	LARVAE		X			X		X		
	ADULT	X		X	X		X		X	
GENERAL HABITAT	LAKE/POND		X					X	X	AND MARSHES
	RIVER							X		SLOW FLOWING
	STREAM									
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON									
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT									
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE							X		
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY									
	CURRENT									
TEMP.	EUTHERMAL >30C									
	MESOTHERMAL 15-30C									
	OLIGOTHERMAL <15C		X							
	STENOTHERMAL <5C									
PH	ACIDOBIONTIC <5.5									
	ACIDOPHILIC <7.0		X							6.8
	ALKALIPHILOUS >=7.0		X							
	ALKALIBIONTIC >8.5		X							9.6
DO	DISS. OXYGEN % SAT.									
	MG/L									
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL									
	NITRATES									
	NITRITES									
	AMMONIA									
	PHOSPHORUS ORTHO									
	TOTAL									
	SEASONAL L							X		APRIL
	DISTRIBUTION A				X					JULY
GEOGRAPHIC DISTRIBUTION	REGION I	X								
	REGION II									
	REGION III									
	REGION IV					X				
	REGION V									
	REGION VI									
	REGION VII									
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: NH, N.W. TERR., NEW FOUND., ONT., QUE., SASK. BRITISH COLUMBIA TO NEW FOUNDLAND AND SOUTH TO NORTH CAROLINA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (41) MILLIMOLES/M^3 Zn 0.02 - 0.92; Cu 0.3 - 0.74; Pb 0.01 - 0.73; Cd <0.01

(135) COLLECTED IN LAKE WITH NO SUMMER DEFICIT IN O_2

(265) TRANSCONTINENTAL IN NORTHERN AND MONTANE AREAS OF NORTH AMERICA

Phryganeidae *Agrypnia pagetana* Curtis

	SOURCE	205	264	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X	X	
	ADULT	X		
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		17 - 210
	CURRENT			
TEMP.	EUTHERMAL >30C			
	MESOTHERMAL 15-30C			
	OLIGOTHERMAL <15C			
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		7.54
	ALKALIBIONTIC >8.5			8.88
DO	DISS. OXYGEN % SAT.	X		51 - 104
	MG/L	X		4.6 - 7.7
H_2O CHEMISTRY	ALKALINITY PHTH.	X		0 - 37
	TOTAL	X		161 - 665
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO			
	TOTAL			
	SEASONAL L	X		APRIL - MAY
	DISTRIBUTION A	X		MAY - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: ALB., MANIT., N.W. TERR.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (205) TOT. DISS. SOLIDS 481 - 2849; TOT. HARDNESS as $CaCO_3$ 140 - 530; Ca HARDNESS as $CaCO_3$ 82 - 211; SO_4 287 - 1350; Cl 12.58 - 35.68

(264) THROUGHOUT NORTHERN PORTIONS OF NORTH AMERICA

Phryganeidae *Banksiola crotchi* Banks

	SOURCE PARAMETERS	167	281	265	264	275	135	NOTES OR RANGES
	LARVAE		X		X	X		
	ADULT	X	X	X			X	
GENERAL HABITAT	LAKE/POND		X			X	X	
	RIVER							
	STREAM					X		SLUGGISH STREAMS
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN					X		
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER					X		IN SEDIMENT
HOME	RETREAT BUILDER							
	CASE MAKER					X		
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE		X			X		
	DETRITIVORE							
	TURBIDITY							
	CURRENT							
TEMP.	EUTHERMAL >30C							
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C							
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0							
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.							
	MG/L							
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL							
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO							
	TOTAL							
	SEASONAL L		X			X		AUGUST - JUNE
	DISTRIBUTION A							JULY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V	X						
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X					X		

STATES AND PROVINCES MENTIONED: BRIT. COL., OH, NEW FOUNDLAND, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (264) TRANSCONTINENTAL EXCEPT ALASKA (135) COLLECTED IN LAKE WITH NO SUMMER DEFICIT IN O_2

Phryganeidae *Oligostomis paradalis* (Walker)

	SOURCE PARAMETERS		210	36	168	264	275																	NOTES OR RANGES
	LARVAE		X		X	X	X																	
	ADULT		X	X																				
GENERAL HABITAT	LAKE/POND																							
	RIVER																							
	STREAM				X	X	X																	
	SPRING																							
	TEMP. WATERS																							
SPECIFIC HABITAT	EPIBENTHIC	ON					X																	
	EMBENTHIC	IN																						
	EPILITHIC	ROCK																						
	EPIPHYTIC	PLANT					X																	
	OTHER																							
HOME	RETREAT BUILDER																							
	CASE MAKER						X																	
	FREELIVING																							
DIET	CARNIVORE																							
	HERBIVORE																							
	OMNIVORE						X																	
	DETRITIVORE																							
	TURBIDITY																							
	CURRENT																							
TEMP.	EUTHERMAL	>30C																						1 - 15
	MESOTHERMAL	15-30C																						
	OLIGOTHERMAL	<15C			X																			
	STENOTHERMAL	<5C			X																			
PH	ACIDOBIONTIC	<5.5																						
	ACIDOPHILIC	<7.0																						
	ALKALIPHILOUS	>=7.0																						
	ALKALIBIONTIC	>8.5																						
DO	DISS. OXYGEN	% SAT.																						
		MG/L																						
H_2O CHEMISTRY	ALKALINITY	PHTH.																						
		TOTAL																						
	NITRATES																							
	NITRITES																							
	AMMONIA																							
	PHOSPHORUS	ORTHO																						
		TOTAL																						
	SEASONAL	L					X																	OCTOBER
	DISTRIBUTION	A																						
GEOGRAPHIC DISTRIBUTION	REGION I		X	X																				
	REGION II		X																					
	REGION III																							
	REGION IV																							
	REGION V																							
	REGION VI																							
	REGION VII																							
	REGION VIII																							
	REGION IX																							
	REGION X																							

STATES AND PROVINCES MENTIONED: NH, NY, NOVA SCOTIA, QUE., ONT.

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (264) EASTERN CANADA AND NORTHEASTERN UNITED STATES; IN SMALL COOL STREAMS

Phryganeidae *Phryganea cinerea* Walker

	SOURCE		210	193	230	265	217	275	135	NOTES OR RANGES
	PARAMETERS									
	LARVAE		X		X			X		
	ADULT		X	X		X	X		X	
GENERAL HABITAT	LAKE/POND		X		X				X	PLUS MARSH
	RIVER						X			
	STREAM									
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON	X							
	EMBENTHIC	IN								
	EPILITHIC	ROCK								
	EPIPHYTIC	PLANT	X							
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER							X		PLANT MATERIALS
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE							X		
	DETRITIVORE									
	TURBIDITY									
	CURRENT									
TEMP.	EUTHERMAL	>30C								
	MESOTHERMAL	15-30C								
	OLIGOTHERMAL	<15C								
	STENOTHERMAL	<5C								
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0								
	ALKALIPHILOUS	>=7.0								
	ALKALIBIONTIC	>8.5								
DO	DISS. OXYGEN	% SAT.								
		MG/L								
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL								
	NITRATES									
	NITRITES									
	AMMONIA									
	PHOSPHORUS	ORTHO								
		TOTAL								
	SEASONAL DISTRIBUTION	L							X	NOVEMBER
		A	X				X			JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X					X		
	REGION II		X							
	REGION III									
	REGION IV									
	REGION V			X	X					
	REGION VI									
	REGION VII									
	REGION VIII			X						
	REGION IX							X		
	REGION X							X		

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., IL, ME, MA, MI, MN, MT, NY, NEWFOUND. ONT., SD, SASK., QUE., WI, WY. NEWFOUNDLAND TO MASS. TO ALASKA AND CALIFORNIA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (230) AT DEPTHS OF UP TO 100 METERS IN LAKE SUPERIOR

(135) COLLECTED IN LAKE WITH AND WITHOUT SUMMER DEFICIT IN O_2

Phryganeidae *Ptilostomis ocellifera* (Walker)

	SOURCE PARAMETERS	210	62	167	282	265	264	245	275	135	NOTES OR RANGES
	LARVAE	X	X		X		X		X		
	ADULT	X		X		X		X		X	
GENERAL HABITAT	LAKE/POND										
	RIVER										
	STREAM	X	X				X	X		X	
	SPRING						X				
	TEMP. WATERS										
SPECIFIC HABITAT	EPIBENTHIC ON				X						
	EMBENTHIC IN										
	EPILITHIC ROCK										
	EPIPHYTIC PLANT				X						
	OTHER				X						MUD
HOME	RETREAT BUILDER										
	CASE MAKER								X		LEAF PIECES
	FREELIVING										
DIET	CARNIVORE								X		
	HERBIVORE										
	OMNIVORE										
	DETRITIVORE										
	TURBIDITY		X							X	0.5 - 1.8
	CURRENT										
TEMP.	EUTHERMAL >30C										0 - 30
	MESOTHERMAL 15-30C		X							X	
	OLIGOTHERMAL <15C									X	
	STENOTHERMAL <5C									X	
PH	ACIDOBIONTIC <5.5										
	ACIDOPHILIC <7.0									X	5.9
	ALKALIPHILOUS >=7.0	X									
	ALKALIBIONTIC >8.5	X									9.1
DO	DISS. OXYGEN % SAT.									X	66 - 95
	MG/L									X	6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.										
	TOTAL									X	3.7 - 6.7
	NITRATES		X							X	SEE COMMENTS
	NITRITES		X							X	SEE COMMENTS
	AMMONIA										
	PHOSPHORUS ORTHO		X							X	0.01 - 0.55
	TOTAL		X								0 - 0.47
	SEASONAL L				X				X		OCTOBER - JUNE
	DISTRIBUTION A	X			X	X					APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I										
	REGION II	X									
	REGION III	X									
	REGION IV										
	REGION V	X		X							
	REGION VI							X			
	REGION VII										
	REGION VIII										
	REGION IX										
	REGION X										

STATES AND PROVINCES MENTIONED: AR, BRIT. COL., IL, IN, MI, NJ, NY, NEW FOUNDLAND, NOVA SCOTIA, OH, ONT., PA, QUE., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (62, 135) SPEC. COND. 17 - 473; TOT. COLIFORMS AS HIGH AS 7.5 X 10^6/100 ML; TOT. HARDNESS as $CaCO_3$ 9.0 - 260; TOT. ORG. C 4.0 - 20; TOT. KJ. N 0.26 - 1.8; TOT. DDT 0 - 0.10 uG/L; PCB 0 - 0.25 uG/L; TOT. PHENOXYS 0 - 2.81 uG/L; Na 2.0 - 9.7; K 1.2 - 8.3; NO_2 + NO_3 0 - 6.13; SO_4 26.0; SO_2 2.6; As 0.61 - 0.20; Cd 0.01 - 0.02; Cu 0.03 - 0.18; Pb 0.01 - 0.02

(62) AT ONE STATION APPROX. TWO MONTHS PER YEAR WITH NO FLOW BETWEEN POOLS, SUMMER DENSE GROWTHS OF *Cladophora*

(264) TRANSCONTINENTAL. COOL SPRING POOLS OR STREAMS, OFTEN WITH SPECIES OF *Oligostomis*

(275) WIDE RANGE OF HABITATS, COOL STREAMS TO LAKES AND TEMPORARY VERNAL POOLS. UNIVOLTINE.

Phryganeidae *Yphria californica* (Banks)

	SOURCE	5	266	275	NOTES OR RANGES
	PARAMETERS				
	LARVAE	X	X	X	
	ADULT	X	X		
GENERAL HABITAT	LAKE/POND				
	RIVER	X			
	STREAM		X	X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON			X	
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER		X	X	
	FREELIVING				
DIET	CARNIVORE			X	
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY	X			0.2 - 3.6
	CURRENT	X			71 CM/S
TEMP.	EUTHERMAL >30C				6 - 20.6
	MESOTHERMAL 15-30C		X		
	OLIGOTHERMAL <15C	X	X		
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0				
	ALKALIPHILOUS >=7.0	X			7.3 - 7.6
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.				
	MG/L				
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL	X			53 - 58
	NITRATES	X			0.01 - 0.05
	NITRITES				
	AMMONIA				
	PHOSPHORUS ORTHO	X			0.2 - 0.57
	TOTAL				
	SEASONAL L			X	JUNE
	DISTRIBUTION A		X	X	JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX		X	X	
	REGION X	X		X	

STATES AND PROVINCES MENTIONED:CA, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS:(5) HARDNESS as $CaCO_3$ 41.2 - 48.8; SPEC. COND. 92 - 118; Ca 5.9 - 8; MEAN DEPTH 21.3 CM; MEAN STREAM WIDTH 30.5 M

(266) RESTRICTED TO MORE QUIET, MARGINAL POOLS AND DEEPER PORTIONS OF STREAM, ELEVATION 5000 - 6000 FT

POLYCENTROPODIDAE

These netspinning caddisflies are represented by seven genera and approximately seventy species in the United States. All utilize nets to enhance their capture of foods from a fixed retreat. There is great diversity of net structure in this family. Larvae are found in both lentic and lotic habitats. They are the predominant netspinners in calm waters and often times are found in great numbers. Larvae are not described for the genus Cernotina in the United States. We have profiles for a species of five of the remaining six genera.

1. Genus Cernotina Ross

Although seven species of this genus are known from North America, the larvae remain undescribed. Therefore, no water quality data are available for species of this genus.

2. Genus Cyrnellus Banks

Only one eastern species, C. fraternus (Banks), is known from this genus. It is probably the most commonly collected caddisfly from large, warm water rivers and reservoirs in the southeast. It is also known from smaller rivers, streams and lakes. The species seems to be fairly tolerant to mild forms of pollution.

3. Genus Neureclipsis McLachlan

Larvae of this genus are known for their distinctive trumpet-shaped net. Larvae of two of the five species known from the United States are described. We include a profile of N. crepuscularis (Walker), a predominantly large river species. The larvae are restricted to slow moving lotic habitats.

4. Genus Nyctiophylax Brauer

Areas of reduced current in streams and lakes provide habitat for the three described larvae of this genus. We include water data for N. moestus Banks and five other species are known from North America. Larvae live in an open-ended silken tube and are predaceous.

5. Genus *Phylocentropus* Banks

Five eastern species of this genus occur in the United States. Larvae are known for three of these, and we include water data for one, *Phylocentropus placidus* Banks. Larvae burrow into the sand where they construct branching silken tubes to the surface to channel water past a capture net. The larvae are most frequently collected along the margins of sandy streams or lakes.

6. Genus *Polycentropus* Curtis

This is the largest polentropodid genus in North America with approximately forty species found in the United States. Larval keys are lacking for the genus, although the larvae of six species are described. The larvae are found in slow moving current or lentic waters where they build a tube net with a funnel for prey capture. They maintain themselves in this retreat until a prey comes along, then they rush out to capture the organism. We include water data for only one species, *P. cinereus* (Hagen).

7. Genus *Polyplectropus* Ulmer

Only two species, *P. charlesi* (Ross) and *P. proditus* (Edwards), of this genus are known from the United States. They are collected from rocks in small, cool streams in Region VI. We have no water data for this genus.

Polycentropodidae *Cyrnellus fraternus* (Banks)

	SOURCE		210	261	245	275	123	174	167	NOTES OR RANGES
	PARAMETERS									
	LARVAE					X	X	X		
	ADULT		X	X	X				X	
GENERAL HABITAT	LAKE/POND					X				
	RIVER		X	X	X	X	X	X	X-	
	STREAM		X			X				
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON				X				
	EMBENTHIC	IN								
	EPILITHIC	ROCK				X				
	EPIPHYTIC	PLANT								
	OTHER									
HOME	RETREAT BUILDER					X				
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY							X		10 - 750
	CURRENT									
TEMP.	EUTHERMAL	>30C					X	X		6.9 - 31.2
	MESOTHERMAL	15-30C					X	X		
	OLIGOTHERMAL	<15C					X			
	STENOTHERMAL	<5C								
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0						X		6.1
	ALKALIPHILOUS	>=7.0						X	X	
	ALKALIBIONTIC	>8.5						X		8.6
DO	DISS. OXYGEN	% SAT.							X	87 - 130
		MG/L					X	X		1.7 - 12.0
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL						X	X	0 - 252
	NITRATES									
	NITRITES									
	AMMONIA									
	PHOSPHORUS	ORTHO								
		TOTAL								
	SEASONAL	L				X		X		MAY - DECEMBER
	DISTRIBUTION	A	X	X	X					MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II									
	REGION III							X		
	REGION IV		X			X	X	X		
	REGION V		X			X		X	X	
	REGION VI		X		X	X				
	REGION VII		X	X		X				
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED:AL, AR, GA, IL, IN, IA, KY, MI, MN, MO, OH, OH, PA, TN, WI. MINNESOTA TO TEXAS AND EASTWARD

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (174, 167) TOT. DISS. SOLIDS 126 - 669; FREE CO_2 0.0 - 10.0; HARDNESS as $CaCO_3$ 110 - 250; Cl 30 - 120; TOT. COLIFORMS 2 - 323 PER 100 ML

(174) FACULATIVE POLLUTION TOLERANCE

(261) COLLECTED WITH LIGHT TRAP AT LOCK 19 OF MISSISSIPPI RIVER, COMPOSED 8.8% OF TOTAL

(275) MORE COMMON IN THE SOUTHEASTERN AND MIDWESTERN SECTIONS THAN IN THE NORTHEAST

Polycentropodidae *Neureclipsis crepuscularis* (Walker)

	SOURCE PARAMETERS	210	36	13	51	98	174	227	183	261	245	NOTES OR RANGES
	LARVAE	X		X	X	X						
	ADULT	X	X					X	X	X		
GENERAL HABITAT	LAKE/POND											
	RIVER	X		X	X		X			X		
	STREAM										X	
	SPRING											
	TEMP. WATERS											
SPECIFIC HABITAT	EPIBENTHIC ON											
	EMBENTHIC IN											
	EPILITHIC ROCK											
	EPIPHYTIC PLANT											
	OTHER											
HOME	RETREAT BUILDER	X										
	CASE MAKER											
	FREELIVING											
DIET	CARNIVORE											
	HERBIVORE											
	OMNIVORE											
	DETRITIVORE											
	TURBIDITY				X	X	X	X				0.6 - 450
	CURRENT				X							0.31 - 3.91 FT/S
TEMP.	EUTHERMAL >30C											11 - 29.2
	MESOTHERMAL 15-30C			X	X		X					
	OLIGOTHERMAL <15C					X						
	STENOTHERMAL <5C											
PH	ACIDOBIONTIC <5.5											
	ACIDOPHILIC <7.0						X					6.0
	ALKALIPHILOUS >=7.0			X	X	X	X					
	ALKALIBIONTIC >8.5			X								8.7
DO	DISS. OXYGEN % SAT.			X		X		X				75 - 105
	MG/L			X	X	X	X	X				5.5 - 12.4
H_2O CHEMISTRY	ALKALINITY PHTH.			X		X		X				0 - 10
	TOTAL			X	X	X	X					35 - 174
	NITRATES			X	X	X		X				0.1 - 2.5
	NITRITES			X	X	X		X				0.000 - 0.1
	AMMONIA			X	X	X						0.30 - 1.0
	PHOSPHORUS ORTHO			X		X		X				0.0 - 0.15
	TOTAL				X							0.9
	SEASONAL L			X	X	X						APRIL - DECEMBER
	DISTRIBUTION A	X	X							X		MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I		X									
	REGION II	X							X			
	REGION III	X										
	REGION IV	X										
	REGION V	X					X					
	REGION VI	X		X							X	
	REGION VII				X	X				X		
	REGION VIII											
	REGION IX											
	REGION X											

STATES AND PROVINCES MENTIONED: AR, IA, IL, IN, KY, MI, MO, NH, NY, NEW BRUNS., NC, NOVA SCOTIA, OH, PA, QUE., TN, VA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (13, 51, 98, 174, 227) SPEC. COND. 17 - 350; COLIFORMS 110 - 1080 / 100 ML; FECAL STREPTOCOCCI 6/100 ML; TOT. HARDNESS as $CaCO_3$ 9.0 - 185; Mg HARDNESS as $CaCO_3$ 10; Ca HARDNESS as $CaCO_3$ 151; COLOR 2 UNITS: DETERGENTS as ABS 0.0; Ca 104, Mg 80 - 81; Si 3.4 - 9.8; Fe 0.02 - 1.4; Mn 0.00 - 0.01; Na 4.3 - 4.7; K 0.8 - 1.5; Cl 6.8 - 8.3; Fl 0.0 - 0.2; Zn 0.019, Hg 0.5 ug/L; SO_4 4.0; Pb 3 ug/L; Cd 1.0 ug/L; CYANIDE 0.1; PHENOLS 0.004; TOT. ORG. C 5 - 13; As 0.0020; TOT. DISS. SOLIDS 146 - 315

(227) SPECIMENS CAUGHT IN LIGHT TRAPS BY STREAM WITH THREE LAKES NEARBY

(261) LIGHT TRAP AT LOCK 19 MISSISSIPPI RIVER, COMPOSED LESS THAN 0.5% OF TOTAL

Polycentropodidae *Nyctiophylax moestus* Banks

	SOURCE / PARAMETERS		210	167	135	NOTES OR RANGES
	LARVAE		X			
	ADULT			X	X	
GENERAL HABITAT	LAKE/POND				X	
	RIVER			X		
	STREAM		X			
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON	X			
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT	X			LOGS
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT		X			RAPID
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0		X		7 - 8.2
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.	X			87 - 130
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X			30 - 140
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L	X			JUNE - AUGUST
	DISTRIBUTION	A				
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV		X			
	REGION V		X	X		
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: IL, FL, MI, OH, QUE., WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (167) FREE CO_2 0.0 - 10.0; HARDNESS as $CaCO_3$ 110 - 250; Cl 30 - 120; TOT. COLIFORMS 2 - 323/100 ML
(135) COLLECTED IN LAKES WITH AND WITHOUT SUMMER O_2 DEFICIT

Polycentropodidae *Phylocentropus placidus* Banks

	SOURCE PARAMETERS		154	210	36	227	NOTES OR RANGES
	LARVAE		X	X			
	ADULT			X	X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM		X				
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN		X			
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER			X			SAND
HOME	RETREAT BUILDER						
	CASE MAKER			X			
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY					X	0.6 - 1.1
	CURRENT						
TEMP.	EUTHERMAL	>30C					
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0	X			X	6.0 - 6.8
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.				X	75 - 95
		MG/L				X	6.7 - 12.4
H_2O CHEMISTRY	ALKALINITY	PHTH.				X	4.4 - 6.2
		TOTAL					
	NITRATES		X			X	SEE COMMENTS
	NITRITES					X	SEE COMMENTS
	AMMONIA		X				0.003 MEQ./L
	PHOSPHORUS	ORTHO	X			X	SEE COMMENTS
		TOTAL					
	SEASONAL DISTRIBUTION	L	X				JUNE
		A		X	X		APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			X	X		
	REGION II			X			
	REGION III			X			
	REGION IV			X			
	REGION V			X			
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: GA, IL, IN, ME, MI, MN, NH, NY, NEW BRUNS., NOVA SCOTIA, OH, ONT., PA, QUE., TN, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSPENDED SEDIMENT 0.78; IN MEQ./L NA 0.049; K 0.08; Ca 0.253; Mg 0.072; SO_4 0.052; Cl 0.025; HCO_3 0.235; H_2PO_4 LESS THAN 0.001

(227) TOT. HARDNESS as $CaCO_3$ 9.0 - 25.5; TOT. ORG. C 5 - 13; $NO_2 + NO_3$ 0 - 0.1; PO_4 0.01 - 0.15; COND. 17 - 32. SPECIMENS WERE COLLECTED WITH LIGHT TRAP BY THE STREAM WITH THREE NEARBY LAKES.

Polycentropodidae *Polycentropus cinereus* (Hagen)

	SOURCE	210	36	166	228	13	190	193	235	167	183	178	282	245	217								NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X				X							X										
	ADULT	X	X	X	X			X		X	X		X	X	X								
GENERAL HABITAT	LAKE/POND	X			X							X	X										
	RIVER	X				X	X		X					X									
	STREAM			X	X									X									
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON												X										
	EMBENTHIC IN																						
	EPILITHIC ROCK	X																					UNDER STONES
	EPIPHYTIC PLANT																						
	OTHER												X										MUD
HOME	RETREAT BUILDER	X																					
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY				X	X			X			X											SEE COMMENTS
	CURRENT																						
TEMP.	EUTHERMAL >30C																						
	MESOTHERMAL 15-30C			X	X	X			X														0 - 26
	OLIGOTHERMAL <15C			X	X				X														
	STENOTHERMAL <5C			X	X				X														
PH	ACIDOBIONTIC <5.5			X																			4.6
	ACIDOPHILIC <7.0			X	X				X														
	ALKALIPHILOUS >=7.0								X														
	ALKALIBIONTIC >8.5					X																	8.8
DO	DISS. OXYGEN % SAT.				X	X																	66 - 99
	MG/L				X	X																	6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.				X	X																	3.7 - 14
	TOTAL					X						X											55.0 - 122
	NITRATES				X				X			X											
	NITRITES				X	X																	0.000
	AMMONIA					X						X											0.02 - 0.55
	PHOSPHORUS ORTHO				X	X			X														0.0 - 0.15
	TOTAL								X			X											0.02 - 0.86
	SEASONAL L					X																	APRIL
	DISTRIBUTION A	X	X											X									MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I	X	X	X																			
	REGION II	X									X												
	REGION III	X																					
	REGION IV	X																					
	REGION V	X								X													
	REGION VI	X												X									
	REGION VII	X				X																	
	REGION VIII	X					X																
	REGION IX																						
	REGION X	X							X														

STATES AND PROVINCES MENTIONED:AR, BRIT. COL., D.C., IL, IN, KY, ME, MI, MN, MO, MT, MANITOBA, NH, NY, NC, NEW BRUNS., NOVA SCOTIA, OH, OK, OR, ONT., PA, QUE., SASK., SD, TN, WA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (228, 13, 235, 178) SPEC. COND. 17 - 250; TOT. HARDNESS as $CaCO_3$ 9.0 - 144; TOT. ORG. C 0.1 - 20; COLIFORMS 110/100 ML; TOT. RESIDUE 50 - 282; TRUE COLOR 5; TOT. KJ. N 0.05 - 0.22; Ca 5.4 - 74; Mg 1.4 - 70; Si 9.1 - 47.6; Fe 0 - 0.63; Na 3.0 - 8.2; K 0.4 - 2.0; Fl 0 - 0.6; Cl 1.2 - 31; SO_4 3 - 50; B 0.0 - 0.06; As LESS THAN 0.04; TURBIDITY 0.5 - 1.8 JTU, 0.5 - 180 NTU

(227) COLLECTED IN LAKES WITH AND WITHOUT SUMMER DEFICIT IN O_2

(210) COOL AND CLEAR WATER PREFERENCE

(190, 235) ELEVATION 360 - 3294 FT

(217) WIDESPREAD THROUGH MOST OF NORTH AMERICA

PSYCHOMYIIDAE

This netspinning family is represented in the United States by five genera and fifteen species. They live in silken retreats most often below the substrate of lotic waters, although one genus Tinodes are collected from standing waters. Larvae are known for four genera; we have water data for three.

1. Genus Lype McLachlan

One eastern species, Lype diversa (Banks), is the sole representative of this genus in the United States. Larvae are restricted to slow moving waters where they incorporate detritus into their silken tunnels. We include a profile for this species.

2. Genus Paduniella Lestage

Only one species of this genus, Paduniella nearctica Flint,is known in the United States. The species is collected from Arkansas. No North American larvae are known for this genus and no water quality data is available.

3. Genus Psychomyia Pictet

Three rheophillic North American species of this genus are known. The larvae are often collected in large numbers on tops of rocks where they inhabit meandering silken tubes. We have a profile for the most commonly collected species Psychomyia flavida Hagen.

4. Genus Tinodes Stephens

We have minimal water data for only one of the nine North American species of this genus. Larvae are primarily western and montane and are collected from rock surfaces in warmer waters.

5. Genus Xiphocentron Brauer

This genus is represented by only one species, Xiphocentron mexico Ross, which is known from Texas in Region VI. Larvae build silken retreats which frequently extend above the water surface on wet substrates. They are known only from springs. We have no water quality data available for this genus.

Psychomyiidae *Lype diversa* (Banks)

	SOURCE	210	36	227	283	167	245	275	166	135													NOTES OR RANGES
	PARAMETERS																						
	LARVAE							X															
	ADULT	X	X	X		X	X		X	X													
GENERAL HABITAT	LAKE/POND																						
	RIVER					X																	
	STREAM	X			X		X		X	X													
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON							X															
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT							X															WOOD
	OTHER																						
HOME	RETREAT BUILDER							X															
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY			X	X					X													0 - 26
	CURRENT																						
TEMP.	EUTHERMAL >30C																						0 - 26
	MESOTHERMAL 15-30C				X				X	X													
	OLIGOTHERMAL <15C				X				X	X													
	STENOTHERMAL <5C				X				X	X													
PH	ACIDOBIONTIC <5.5								X														4.6
	ACIDOPHILIC <7.0			X	X				X	X													
	ALKALIPHILOUS >=7.0					X																	8.2
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.			X																			66 - 95
	MG/L			X	X					X													6.7 - 12.9
H_2O CHEMISTRY	ALKALINITY PHTH.			X						X													3.7 - 6.7
	TOTAL				X	X																	10 - 117
	NITRATES			X						X													SEE COMMENTS
	NITRITES			X						X													SEE COMMENTS
	AMMONIA																						
	PHOSPHORUS ORTHO			X						X													0.01 - 0.15
	TOTAL				X																		4.05 - 9.84 μg/L
	SEASONAL L							X															MAY
	DISTRIBUTION A		X																				MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I	X	X					X	X														
	REGION II	X																					
	REGION III	X																					
	REGION IV	X			X			X															
	REGION V	X				X		X															
	REGION VI						X																
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: AR, FL, IL, MI, NH, NY, NC, OH, ONT., QUE., TN, VT, VA, WI EASTERN ½ NORTH AMERICA AS FAR NORTH AS WISCONSIN AND MAINE

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (227, 283, 167, 135) TOT. HARDNESS as $CaCO_3$ 9.0 - 240; TOT. ORG. C 4 - 20; SPEC. COND. 8.7 - 40; FREE CO_2 0.0 - 8.5; TOT. COLIFORMS 3/100 ML; Ca 0.470 - 1.077; Mg 0.213 - 0.648; K 0.431 - 0.616; Na 0.639 - 1.125; Cl 35 - 75

(227, 135) $NO_2 + NO_3$ 0 - 0.1

(227) SPECIMENS COLLECTED WITH LIGHT TRAP BY STREAM WITH THREE LAKES NEARBY

(135) COLLECTED IN LAKES WITH AND WITHOUT SUMMER DEFICIT IN O_2

Psychomyiidae *Psychomyia flavida* (Hagen)

	SOURCE PARAMETERS	210	36	154	13	98	113	146	148	190	193	227	256	62	245	275	114						NOTES OR RANGES
	LARVAE	X			X	X	X	X	X		X			X		X	X						
	ADULT	X	X	X							X	X			X								
GENERAL HABITAT	LAKE/POND																						
	RIVER	X			X	X	X		X	X					X		X						
	STREAM	X		X									X	X	X								
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER	X																					
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE															X							
	DETRITIVORE																						
	TURBIDITY				X	X	X		X			X		X			X						1.3 - 8.0
	CURRENT	X																					SWIFT
TEMP.	EUTHERMAL >30C																						1 - 25
	MESOTHERMAL 15-30C				X		X		X								X						
	OLIGOTHERMAL <15C				X	X	X						X				X						
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0			X			X					X					X						6.0
	ALKALIPHILOUS >=7.0				X		X	X	X				X				X						
	ALKALIBIONTIC >8.5				X	X																	8.7
DO	DISS. OXYGEN % SAT.				X	X	X					X	X				X						75 - 134
	MG/L				X	X	X	X				X	X				X						6.6 - 15.6
H_2O CHEMISTRY	ALKALINITY PHTH.				X	X						X											0 - 12
	TOTAL				X	X	X	X									X						3.6 - 192
	NITRATES				X	X	X	X				X					X						0.2 - 2.3
	NITRITES				X	X	X					X											0.000 - 0.010
	AMMONIA			X	X	X	X	X									X						0 - 0.75
	PHOSPHORUS ORTHO				X	X		X				X											0.0 - 0.39
	TOTAL						X	X									X						0.03 - 0.17
	SEASONAL L	X			X	X	X		X														APRIL - DECEMBER
	DISTRIBUTION A	X	X	X											X								FEB. - SEPT.
GEOGRAPHIC DISTRIBUTION	REGION I	X	X				X										X						
	REGION II	X																					
	REGION III	X																					
	REGION IV	X																					
	REGION V	X							X														
	REGION VI	X													X								
	REGION VII	X			X	X		X															
	REGION VIII	X								X				X									
	REGION IX																						
	REGION X	X																					

STATES AND PROVINCES MENTIONED: AR, CO, ID, IL, IN, KY, MA, MI, MO, MT, MH, NY, NC, NEW BRUNS., OH, OK, ONT., PA, QUE., SASK., TN, WI, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.78; REST IN MEQ./L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; NH_4 0.003; HCO_3 0.235; SO_4 0.052; Cl 0.025; NO_3 0.007; H_2PO_4 LESS THAN 0.001

(13, 98, 113, 146, 227, 256, 62, 114) SPEC. COND. 17 - 380; COLIFORMS 10 - 80/100 ML; TOT. HARDNESS as $CaCO_3$ 9.0 - 194; DETERGENTS as ABS 0.0; FECAL STREPTOCOCCI 12/100 ML; Ca HARDNESS as $CaCO_3$ 30.4 - 142; Mg HARDNESS as $CaCO_3$ 13; COLOR 2 UNITS; COD 0 - 3; BOD 2.6; TOT. ORG. C 5 - 13; TOT. KJ. N 0.26; SUSP. SOLIDS 28; DISS. SOLIDS 274; Ca 76 - 102; Mg 60 - 90; Si 2.9 - 9.9; Fe 0.01 - 0.32; Mn 0.0 - 0.1; Na 0.9 - 6.0; K 1.0 - 3.6; SO_4 5 - 14; Cl 3.0 - 8.2; Fl 0.1 - 0.86

(190) ELEVATION 3140 - 5110 FT

(227) SPECIMENS COLLECTED WITH LIGHT TRAP BY STREAM ALSO WITH THREE LAKES NEARBY

(275) MOST OF NORTH AMERICA: PROBABLY FACULATIVELY PARTHENOGENETIC

Psychomyiidae *Tinodes consueta* McLachlan

	SOURCE		71	235	NOTES OR RANGES
	PARAMETERS				
	LARVAE			X	
	ADULT		X		
GENERAL HABITAT	LAKE/POND				
	RIVER			X	
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	ENBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY			X	0.3 - 16 NTU
	CURRENT				
TEMP.	EUTHERMAL	>30C			2.6 - 19
	MESOTHERMAL	15-30C		X	
	OLIGOTHERMAL	<15C		X	
	STENOTHERMAL	<5C		X	
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0		X	6.0
	ALKALIPHILOUS	>=7.0		X	8.2
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES			X	0.05 - 0.17
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO		X	0.02 - 0.05
		TOTAL		X	0.02 - 0.6
	SEASONAL	L			
	DISTRIBUTION	A	X		JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX		X		
	REGION X			X	

STATES AND PROVINCES MENTIONED: CA, OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 101; TOT. ORG. C 0.1 - 5.1; TOT. RESIDUE 55 - 102.3; TOT. KJ. N 0.03 - 0.19; Fe 0.05 - 0.71; Ca 6.2 - 16; Mg 1.5 - 6.0; Na 3.1 - 8.4; K 0.5 - 1.6; HCO_3 30 - 60; Fl 0 - 0.1; SO_4 3.0 - 12; Cl 1 - 11; B 0 - 0.06; Ca - Mg HARDNESS 22 - 53; NON - CARBONATE HARDNESS 0 - 10; ELEVATION 1000 - 1500 FT

RHYACOPHILIDAE

This predaceous family of caddisflies has over one hundred species in the United States. There are three genera that are most commonly found in cool, lotic habitats. Larvae are free-living and are quite active. We have abundant water quality data for the most abundant genus, *Rhyacophila*, but have no data for *Atopsyche* or *Himalopsyche*.

1. Genus *Atopsyche* Banks

This rhyacophilid genus is represented in the United States by only three North American species. They are southwestern, having been collected from cool streams in Texas, Arizona, and Nevada. They are unique in that they have chelate prolegs. We have no water quality profiles for this genus.

2. Genus *Himalopsyche* Banks

One species of this genus, *H. phryganea* (Ross), is known from mountain streams in Regions IX and X. No water quality data are available for this species.

3. Genus *Rhyacophila* Pictet

This is by far the largest genus of the Rhyacophilidae with over one hundred described species from the United States. We have water quality data for thirty-seven species. Larvae are adapted to a large number of primarily lotic habitats and some species are even recorded from temporary streams. Most species are active predators, although a few are herbivorous. Members of this genus are found throughout the United States.

Rhyacophilidae *Rhyacophila acropedes* Banks

	SOURCE PARAMETERS		36	5	2	69	10	202	157	247	287	1	259	233	141	NOTES OR RANGES
	LARVAE			X	X		X	X		X	X	X		X	X	
	ADULT		X	X		X	X		X				X	X		
GENERAL HABITAT	LAKE/POND															
	RIVER			X					X					X	X	
	STREAM			X	X		X	X		X	X	X	X	X		
	SPRING															
	TEMP. WATERS															
SPECIFIC HABITAT	EPIBENTHIC	ON		X											X	
	EMBENTHIC	IN														
	EPILITHIC	ROCK		X											X	
	EPIPHYTIC	PLANT		X												
	OTHER														X	SAND
HOME	RETREAT BUILDER															
	CASE MAKER			X												
	FREELIVING															
DIET	CARNIVORE			X	X											
	HERBIVORE															
	OMNIVORE															
	DETRITIVORE						X									
	TURBIDITY			X								X				0.2 - 3.6
	CURRENT			X						X		X			X	0.65 - 1.54 M/S
TEMP.	EUTHERMAL	>30C														0 - 24
	MESOTHERMAL	15-30C					X	X		X						
	OLIGOTHERMAL	<15C		X	X			X		X		X				
	STENOTHERMAL	<5C						X		X		X				
PH	ACIDOBIONTIC	<5.5														
	ACIDOPHILIC	<7.0						X		X				X		6.6
	ALKALIPHILOUS	>=7.0		X				X		X	X	X		X		8.5
	ALKALIBIONTIC	>8.5														
DO	DISS. OXYGEN	% SAT.												X		90 - 116
		MG/L									X			X		8.0 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.														
		TOTAL		X				X		X	X	X		X		9 - 200
	NITRATES															
	NITRITES															
	AMMONIA									X						0.15 - 0.25
	PHOSPHORUS	ORTHO		X						X						0.2 - 0.57
		TOTAL														
	SEASONAL	L			X			X		X				X		JAN. - DEC
	DISTRIBUTION	A	X	X		X	X		X				X			APRIL - SEPT
GEOGRAPHIC DISTRIBUTION	REGION I		X			X								X		
	REGION II													X		
	REGION III															
	REGION IV															
	REGION V								X					X	X	
	REGION VI															
	REGION VII															
	REGION VIII				X	X	X		X	X	X	X	X	X		
	REGION IX						X							X		
	REGION X			X			X	X								

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, CO, ID, LABRADOR, ME, MI, MT, NH, NY, NV, OR, ONT., SD, UT, WY, WA, WI

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 202, 247, 287, 1, 233) SPEC. COND. 14.3 - 118; HARDNESS as $CaCO_3$ 15 - 1050; TOT. DISS. SOLIDS <100 - 200; Ca 0.54 - 22.4; Mg 0.00 - 5.56; Na 1.04 - 74.72; K 0.63 - 11.73; Fe 0.22 - 0.31; Mn 0.20 - 0.46; Cl 2.00 - 54.96; Si 58.6 - 86.0; SO_4 4.00 - 12.00

(2, 69, 202, 233) ELEVATION 1,000 - 10,000 FT

(5) AVG. STREAM WIDTH 30.5 M, AVG. DEPTH 21.3 CM

(233) RESTRICTED TO FAST RIFFLE

(247) FOUND IN RIFFLE BOTH ABOVE AND BELOW GEYSER BASIN

Rhyacophilidae *Rhyacophilia amicis*

	SOURCE		244	NOTES OR RANGES
	PARAMETERS			
	LARVAE		X	
	ADULT			
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM		X	
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY			
	CURRENT			
TEMP.	EUTHERMAL	>30C		5 - 15
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C	X	
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0	X	6.3 - 6.9
	ALKALIPHILOUS	>=7.0		
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.		
		MG/L	X	8.8 - 10.6
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL	X	2.2 - 4.5
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A		
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV		X	
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X			

STATES AND PROVINCES MENTIONED: NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244) SPEC. COND. 8 - 20; PHTH. ACIDITY as $CaCO_3$ 2.0 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 24; SO_4 ND - 5.8

Rhyacophilidae *Rhyacophilia angelita* Banks

	SOURCE		2	69	10	165	1	217	233	NOTES OR RANGES
	PARAMETERS									
	LARVAE		X			X	X		X	
	ADULT			X	X			X	X	
GENERAL HABITAT	LAKE/POND									
	RIVER					X			X	
	STREAM		X	X	X		X	X	X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC	ON								
	EMBENTHIC	IN								
	EPILITHIC	ROCK								
	EPIPHYTIC	PLANT								
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING				X					
DIET	CARNIVORE		X		X					
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY						X		X	1 - 2.3
	CURRENT						X			0.65 - 1.54
TEMP.	EUTHERMAL	>30C								0 - 18
	MESOTHERMAL	15-30C				X				
	OLIGOTHERMAL	<15C				X	X			
	STENOTHERMAL	<5C				X	X			
PH	ACIDOBIONTIC	<5.5								
	ACIDOPHILIC	<7.0							X	6.6
	ALKALIPHILOUS	>=7.0				X	X		X	
	ALKALIBIONTIC	>8.5				X				8.55
DO	DISS. OXYGEN	% SAT.							X	90 - 116
		MG/L				X			X	6.8 - 12.7
H_2O CHEMISTRY	ALKALINITY	PHTH.								
		TOTAL				X	X		X	15 - 231
	NITRATES					X				0.12 - 1.04
	NITRITES					X				0.00 - 0.11
	AMMONIA					X				0.24 - 2.35
	PHOSPHORUS	ORTHO				X				0.01 - 0.52
		TOTAL								
	SEASONAL	L	X			X			X	
	DISTRIBUTION	A		X	X				X	
GEOGRAPHIC DISTRIBUTION	REGION I								X	
	REGION II									
	REGION III				X					
	REGION IV				X					
	REGION V									
	REGION VI									
	REGION VII									
	REGION VIII		X	X	X	X	X		X	
	REGION IX			X	X				X	
	REGION X				X				X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, CO, MT, NH, OR, UT, WA, WY, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) SPEC. COND. 266 - 533; (IN uG/L) Fe 0.07 - 3.74; Zn 0.008 - 0.038; Cu 0.002 - 0.024; Cd 0.00001 - 0.00016; (REST IN MG/L) TOT. HARDNESS as $CaCO_3$ 165 - 230; Ca 39.2 - 62.7; Cl 0.8 - 10.4; F 0.21 - 0.28

(1, 233) TOT. HARDNESS as $CaCO_3$ 15 - 294; TOT. DISS. SOLIDS <100 - 300

(2, 233) ELEVATION 1800 - 10,000 FT

Rhyacophilidae

Rhyacophila arnaudi Denning

	SOURCE PARAMETERS		69	10	242	235	243	NOTES OR RANGES
	LARVAE			X	X		X	
	ADULT		X	X			X	
GENERAL HABITAT	LAKE/POND							
	RIVER					X		
	STREAM				X		X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON						
	EMBENTHIC	IN						
	EPILITHIC	ROCK						
	EPIPHYTIC	PLANT						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING		X					
DIET	CARNIVORE		X			X		
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY				X			0.3 - 16 NTU
	CURRENT		X			X		1.4 - 1.75
TEMP.	EUTHERMAL	>30C						2.6 - 19
	MESOTHERMAL	15-30C			X			
	OLIGOTHERMAL	<15C			X			
	STENOTHERMAL	<5C			X			
PH	ACIDOBIONTIC	<5.5						
	ACIDOPHILIC	<7.0			X			6.0
	ALKALIPHILOUS	>=7.0			X			8.2
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.						
		MG/L						
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL						
	NITRATES				X			<0.05 - 0.17
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO			X			<0.02 - 0.05
		TOTAL			X			0.02 - 0.6
	SEASONAL DISTRIBUTION	L						
		A	X	X			X	MARCH - APRIL
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX			X				
	REGION X		X	X	X	X	X	

STATES AND PROVINCES MENTIONED: OR. WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 101; TOT. KJ. N 0.03 - 0.19; TOT. RESIDUE 55 - 102.3; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 22 - 53; NON-CARBONATE HARDNESS 0 - 10; Si 9.2 - 42.8; Fe 0.05 - 0.71; Ca 6.2 - 16; Mg 1.5 - 6.0; Na 3.1 - 8.4; K 0.5 - 1.6; HCO_3 30 - 60; F 0 - 0.1; SO_4 3.0 - 12; Cl 1 - 11; B 0 - 0.06

(242) SLIGHT PREFERENCE FOR FASTER CURRENT

(243) ELEVATION 1200 FT

Rhyacophilidae *Rhyacophila atrata* Banks

	SOURCE		36	69	244	NOTES OR RANGES
	PARAMETERS					
	LARVAE				X	
	ADULT		X	X		
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM				X	
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				4 - 16
	MESOTHERMAL	15-30C			X	
	OLIGOTHERMAL	<15C			X	
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0			X	5.9 - 6.9
	ALKALIPHILOUS	>=7.0				
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL			X	ND - 6.5
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X		JUNE - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I		X	X		
	REGION II					
	REGION III					
	REGION IV			X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: MA, NC, NH

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (242) SPEC. COND. 8 - 51; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; SO_4 ND - 5.8

(69) ELEVATION 2100 - 5000 FT

Rhyacophilidae *Rhyacophila bifila* Banks

	SOURCE / PARAMETERS	69	85	10	127	190	235	217	233	NOTES OR RANGES
	LARVAE			X		X	X		X	
	ADULT	X	X	X				X	X	
GENERAL HABITAT	LAKE/POND									
	RIVER				X	X	X		X	
	STREAM		X					X	X	
	SPRING									
	TEMP. WATERS									
SPECIFIC HABITAT	EPIBENTHIC ON			X					X	
	EMBENTHIC IN									
	EPILITHIC ROCK			X					X	
	EPIPHYTIC PLANT									
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING			X						
DIET	CARNIVORE			X						
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY						X		X	0.3 - 23 NTU
	CURRENT									
TEMP.	EUTHERMAL >30C									1 - 23
	MESOTHERMAL 15-30C						X			
	OLIGOTHERMAL <15C				X		X			
	STENOTHERMAL <5C				X		X			
PH	ACIDOBIONTIC <5.5									
	ACIDOPHILIC <7.0						X		X	6.0
	ALKALIPHILOUS >=7.0				X		X		X	
	ALKALIBIONTIC >8.5				X					8.78
DO	DISS. OXYGEN % SAT.								X	90 - 116
	MG/L				X				X	8.1 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL				X				X	3.2 - 220
	NITRATES				X		X			<0.005 - 0.36
	NITRITES				X					0.004 - 0.010
	AMMONIA				X					0.73 - 0.156
	PHOSPHORUS ORTHO				X		X			<0.02 - 0.24
	TOTAL						X			0.02 - 0.86
	SEASONAL L					X			X	APRIL - SEPTEMBER
	DISTRIBUTION A	X	X	X				X	X	MARCH - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II									
	REGION III									
	REGION IV									
	REGION V									
	REGION VI									
	REGION VII									
	REGION VIII		X	X	X	X			X	
	REGION IX	X	X	X					X	
	REGION X		X	X			X		X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, CO, ID, MT, OR, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (127, 235, 233) SPEC. COND. 32 - 410; TOT. DISS. SOLIDS 100 - 300; TOT. HARDNESS as $CaCO_3$ 15 - 220; Ca-Mg HARDNESS 21 - 53; NON-CARBONATE HARDNESS 0 - 10; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 55 - 102; TOT. ORG. C 0.1 - 5.1; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 6.0 - 16; Mg 1.4 - 6.0; Na 3.0 - 8.4; K 0.4 - 1.6; HCO_3 30 - 60; F 0 - 0.6; Cl 1 - 8.5; SO_4 3.0 - 12; B 0 - 0.06

(190, 235, 233) ELEVATION 660 - 6500 FT

Rhyacophilidae *Rhyacophila carolina* Banks

	SOURCE PARAMETERS	154	36	69	146	189	227	283	244	259	233	NOTES OR RANGES
	LARVAE	X			X	X		X	X			
	ADULT		X	X			X				X	
GENERAL HABITAT	LAKE/POND											
	RIVER											
	STREAM					X		X	X	X	X	
	SPRING											
	TEMP. WATERS											
SPECIFIC HABITAT	EPIBENTHIC ON							X				
	EMBENTHIC IN											
	EPILITHIC ROCK											
	EPIPHYTIC PLANT							X				
	OTHER											
HOME	RETREAT BUILDER											
	CASE MAKER											
	FREELIVING											
DIET	CARNIVORE											
	HERBIVORE											
	OMNIVORE											
	DETRITIVORE											
	TURBIDITY						X	X				0 - 26
	CURRENT											
TEMP.	EUTHERMAL >30C											0 - 18.5
	MESOTHERMAL 15-30C							X	X		X	
	OLIGOTHERMAL <15C							X	X		X	
	STENOTHERMAL <5C							X	X		X	
PH	ACIDOBIONTIC <5.5										X	4.6
	ACIDOPHILIC <7.0	X					X	X	X		X	
	ALKALIPHILOUS >=7.0				X							8.2
	ALKALIBIONTIC >8.5											
DO	DISS. OXYGEN % SAT.						X				X	66 - 95
	MG/L				X		X	X	X			6.7 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.											
	TOTAL				X	X	X	X	X			ND - 228
	NITRATES	X			X		X					0.3 - 0.9
	NITRITES						X					SEE COMMENTS
	AMMONIA	X			X							0.1
	PHOSPHORUS ORTHO	X			X		X					0.01 - 0.15
	TOTAL				X			X				0.00405 - 0.24
SEASONAL DISTRIBUTION	L	X										JULY
	A		X	X								JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X	X							X	
	REGION II											
	REGION III					X						
	REGION IV					X		X	X	X		
	REGION V											
	REGION VI											
	REGION VII				X							
	REGION VIII											
	REGION IX											
	REGION X											

STATES AND PROVINCES MENTIONED: KY, MA, MO, NH, NC, NEW BRUNS., QUE., VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (154) SUSP. SED. 0.78; REST IN MEQ/L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; NH_4 0.003; HCO_3 0.235; SO_4 0.052; Cl 0.025; NO_3 0.007; H_2PO_4 $<$0.001

(146, 189, 227, 283, 244) SPEC. COND. 8.7 - 430; COD 0 - 38; Ca HARDNESS as $CaCO_3$ 34.6 - 40; TOT. HARDNESS as $CaCO_3$ 7 - 188; TOT. ORG. C 5 - 20; $NO_2 + NO_3$ 0 - 0.1; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; SO_4 ND - 22; F 0.67 - 0.90; Ca 0.470 - 1.077; Mg 0.213 - 0.648; K 0.431 - 1.7; Na 0.08 - 1.7; Cl 6 - 7; Fe 0.075 - 0.10; Mn 0.02 - 0.38; Si 4.4 - 4.9

Rhyacophilidae *Rhyacophila coloradensis* Banks

	SOURCE / PARAMETERS	2	69	85	165	256	217	233	NOTES OR RANGES
	LARVAE	X			X	X		X	
	ADULT		X	X			X	X	
GENERAL HABITAT	LAKE/POND								
	RIVER				X			X	
	STREAM	X				X	X	X	
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC ON								
	EMBENTHIC IN								
	EPILITHIC ROCK								
	EPIPHYTIC PLANT								
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING								
DIET	CARNIVORE	X							
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY							X	CLOSE TO 0
	CURRENT								
TEMP.	EUTHERMAL >30C								0 - 18
	MESOTHERMAL 15-30C				X				
	OLIGOTHERMAL <15C				X	X			
	STENOTHERMAL <5C				X				
PH	ACIDOBIONTIC <5.5								
	ACIDOPHILIC <7.0								
	ALKALIPHILOUS >=7.0				X	X			7.1
	ALKALIBIONTIC >8.5				X				8.65
DO	DISS. OXYGEN % SAT.					X		X	90 - 116
	MG/L				X	X		X	6.8 - 13.4
H_2O CHEMISTRY	ALKALINITY PHTH.								
	TOTAL				X			X	15 - 231
	NITRATES				X				0.04 - 1.04
	NITRITES				X				0.00 - 0.11
	AMMONIA				X				0.00 - 2.35
	PHOSPHORUS ORTHO				X				0.01 - 0.59
	TOTAL								
	SEASONAL DISTRIBUTION L	X			X				FEB. - DEC.
	A		X	X			X	X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V								
	REGION VI			X					
	REGION VII								
	REGION VIII	X	X	X	X	X		X	
	REGION IX			X				X	
	REGION X			X				X	

STATES AND PROVINCES MENTIONED: AZ, ALB., BRIT. COL., CA, CO, MT, NM, OR, UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (165) SPEC. COND. 260 - 533; (IN μG/L) Fe 0.07 - 3.74; Zn 0.008 - 0.038; Cu 0.002 - 0.024; Cd 0.00001 - 0.00016; (REST IN MG/L) TOT. HARDNESS as $CaCO_3$ 163 - 230; Cl 0.2 - 10.4; F 0.20 - 0.28

(256, 233) FREE CO_2 1.0; BOUND CO_2 4.5 - 5.0; TOT. DISS. SOLIDS <100; TOT. HARDNESS as $CaCO_3$ 15 - 95

(2, 233) ELEVATION 492 - 3450 M

(217) WIDESPREAD WESTERN MONTANE REGION

Rhyacophilidae

Rhyacophila fenestra Ross

	SOURCE		210	188	259	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X	X		
	ADULT		X		X	
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM		X	X		
	SPRING					
	TEMP. WATERS		X			
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY					
	CURRENT					
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0				
	ALKALIPHILOUS	>=7.0		X		8.5
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.		X		120 - 150
		MG/L				
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL				
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L		X		APRIL
	DISTRIBUTION	A			X	MAY
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV			X		
	REGION V		X		X	
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: IL, KY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (188) ASSOCIATED WITH FOLLOWING ALGAE: *Lemanea* AND *Phormidium*

Rhyacophilidae *Rhyacophila fuscula* (Walker)

	SOURCE	210	36	154	12	69	40	113	234	239	157	283	62	244	265	275	240	114	207	166			NOTES OR RANGES
	PARAMETERS																						
	LARVAE			X	X		X	X	X	X		X	X	X		X	X	X	X				
	ADULT	X	X			X					X				X					X			
GENERAL HABITAT	LAKE/POND																						
	RIVER				X			X	X		X	X						X	X				
	STREAM									X			X	X			X			X			
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON											X											
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT											X											
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING																						
DIET	CARNIVORE																						
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY							X				X	X					X					0 - 26
	CURRENT																						
TEMP.	EUTHERMAL >30C																						2.0 - 30
	MESOTHERMAL 15-30C						X	X				X	X	X				X	X				
	OLIGOTHERMAL <15C							X				X		X				X	X				
	STENOTHERMAL <5C											X		X									
PH	ACIDOBIONTIC <5.5																		X	X			3.8
	ACIDOPHILIC <7.0			X			X	X				X		X			X	X	X				
	ALKALIPHILOUS >=7.0						X	X					X					X	X				
	ALKALIBIONTIC >8.5						X						X										9.1
DO	DISS. OXYGEN % SAT.							X										X		X			94 - 110
	MG/L			X		X		X	X			X		X						X			7.0 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.																X						0.0
	TOTAL						X	X				X		X			X	X	X				0 - 190
	NITRATES			X			X	X					X					X					0.05 - 1.7
	NITRITES						X	X															0 - 0.06
	AMMONIA			X			X	X										X					0.0 - 0.4
	PHOSPHORUS ORTHO			X									X										0.023 - 0.55
	TOTAL				X		X	X					X					X					0.02 - 0.47
	SEASONAL L			X	X		X	X		X						X	X		X				JAN. - DEC.
	DISTRIBUTION A		X			X					X												JUNE - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I	X	X		X	X		X										X	X	X			
	REGION II	X																	X				
	REGION III	X					X												X				
	REGION IV	X				X				X		X		X			X		X				
	REGION V	X				X																	
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX																						
	REGION X																						

STATES AND PROVINCES MENTIONED: MA, MN, ME, MI, NH, NY, NC, NEW FOUNDLAND, NOVA SCOTIA, ONT., PA, QUE, TN, VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (164) SUSP. SED. 0.78; REST IN MEQ/L Na 0.049; K 0.008; Ca 0.253; Mg 0.072; NH_4 0.003; HCO_3 0.235; SO_4 0.052; Cl 0.025; NO_3 0.007; H_2PO_4 <0.001

(12, 40, 113, 283, 62, 244, 240, 114, 207) BOD 0 - 2.9; HARDNESS as $CaCO_3$ 7 - 260; SPEC. COND. 8 - 473; TOT. COLIFORMS AS HIGH AS 7.5 X 10^6/100 ML; ORG. C 4.0 - 17.0; TOT. DDT 0 - 0.10 uG/L; PCB 0 - 0.25 uG/L; TOT. PHENOXYS 0 - 2.81 uG/L; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; Fe 0.03 - 0.34; Ca 0.470 - 124; Mg 0.213 - 128; Mn 0.08; Cu <0.01 - 0.18; Zn 0.03; Al 5; Cl 3 - 11; SO_4 ND - 26; K 0.431 - 8.3; CO_2 3.5; Na 0.639 - 9.7; SO_2 2.6; TOT. KJ. N 0.26 - 1.8; As 0.01 - 0.20; Cd 0.01 - 0.02; Pb 0.01 - 0.02

(62) AT ONE SAMPLE SITE APPROX. TWO MONTHS PER YEAR WITH NO FLOW BETWEEN POOLS. SUMMER HAD DENSE GROWTHS OF *Cladophora*.

(207) ELEVATION 120 - 3500 FT

(234) FOUND BOTH ABOVE AND BELOW RESERVOIR UNDER STUDY.

(12) SENSITIVE TO POLLUTION

	SOURCE PARAMETERS	210	36	101	69	189	283	207	16	NOTES OR RANGES
	LARVAE	X		X		X	X	X		
	ADULT	X	X		X				X	
GENERAL HABITAT	LAKE/POND									
	RIVER									
	STREAM	X				X	X	X	X	
	SPRING	X								
	TEMP. WATERS	X								
SPECIFIC HABITAT	EPIBENTHIC ON	X					X			
	EMBENTHIC IN									
	EPILITHIC ROCK	X								
	EPIPHYTIC PLANT						X			
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE									
	DETRITIVORE									
	TURBIDITY						X			0 - 26
	CURRENT									
TEMP.	EUTHERMAL >30C									0 - 18.5
	MESOTHERMAL 15-30C						X		X	
	OLIGOTHERMAL <15C						X	X	X	
	STENOTHERMAL <5C						X		X	
PH	ACIDOBIONTIC <5.5							X	X	4.2
	ACIDOPHILIC <7.0						X	X	X	6.9
	ALKALIPHILOUS >=7.0									
	ALKALIBIONTIC >8.5									
DO	DISS. OXYGEN % SAT.								X	ALMOST COMPLETE
	MG/L						X			8 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.									
	TOTAL					X	X		X	0 - 10
	NITRATES									
	NITRITES									
	AMMONIA									
	PHOSPHORUS ORTHO									
	TOTAL						X			4.05 - 9.84 uG/L
	SEASONAL L							X		JULY
	DISTRIBUTION A		X		X					JULY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I	X	X		X			X	X	
	REGION II	X								
	REGION III	X				X				
	REGION IV	X		X		X	X			
	REGION V	X								
	REGION VI									
	REGION VII									
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: IL, KY, MA, NC, NY, NH, NOVA SCOTIA, TN, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 207) SPEC. COND. 8.7 - 48; TOT. HARDNESS as $CaCO_3$ 16 - 24; Ca 0.470 - 8; Mg 0.213 - 18; K 0.431 - 0.616; Na 0.639 - 1.125; ELEVATION 1700 - 2015 FT

(189) FOUND IN STREAM TYPICALLY OF RELATIVELY HIGHER NUTRIENT CONTENT. LESS AQUATIC VEGETATION, AND <50 MG/L HARDNESS

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Rhyacophilidae *Rhyacophila grandis* Banks

	SOURCE PARAMETERS	6	10	242	217	243	NOTES OR RANGES
	LARVAE		X	X		X	
	ADULT	X	X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM	X	X		X	X	
	SPRING						
	TEMP. WATERS		X				
SPECIFIC HABITAT	EPIBENTHIC ON						
	EMBENTHIC IN						
	EPILITHIC ROCK						
	EPIPHYTIC PLANT						
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING		X				
DIET	CARNIVORE		X			X	
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL 30C						10.6
	MESOTHERMAL 15-30C						
	OLIGOTHERMAL <15C	X					
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0	X					7.0
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.						
	MG/L						
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL						
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS ORTHO						
	TOTAL						
	SEASONAL L		X	X			JAN. - DEC.
	DISTRIBUTION A	X	X			X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX		X				
	REGION X	X	X		X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 207) ELEVATION 700 - 1200 FT (189) CASCADE AND COASTAL REGION

Rhyacophilidae *Rhyacophila hyalinata* Banks

	SOURCE / PARAMETERS		2	69	100	202	235	233	NOTES OR RANGES
	LARVAE		X		X	X		X	
	ADULT			X	X			X	
GENERAL HABITAT	LAKE/POND								
	RIVER						X	X	
	STREAM		X		X	X		X	
	SPRING								
	TEMP. WATERS								
SPECIFIC HABITAT	EPIBENTHIC	ON						X	
	EMBENTHIC	IN							
	EPILITHIC	ROCK						X	
	EPIPHYTIC	PLANT							
	OTHER								
HOME	RETREAT BUILDER								
	CASE MAKER								
	FREELIVING				X				
DIET	CARNIVORE		X		X				
	HERBIVORE								
	OMNIVORE								
	DETRITIVORE								
	TURBIDITY						X		0.5 - 180 NTU
	CURRENT								
TEMP.	EUTHERMAL	>30C							6.0 - 26
	MESOTHERMAL	15-30C					X		
	OLIGOTHERMAL	<15C				X	X		
	STENOTHERMAL	<5C							
PH	ACIDOBIONTIC	<5.5							
	ACIDOPHILIC	<7.0						X	6.6
	ALKALIPHILOUS	>=7.0				X	X	X	8.5
	ALKALIBIONTIC	>8.5							
DO	DISS. OXYGEN	% SAT.						X	90 - 116
		MG/L						X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.							
		TOTAL				X		X	15 - 95
	NITRATES						X		<0.05- 0.5
	NITRITES								
	AMMONIA								
	PHOSPHORUS	ORTHO							
		TOTAL					X		0.02- 0.19
	SEASONAL DISTRIBUTION	L	X		X	X		X	JAN. - DEC.
		A		X	X			X	APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I								
	REGION II								
	REGION III								
	REGION IV								
	REGION V								
	REGION VI								
	REGION VII								
	REGION VIII		X	X	X			X	
	REGION IX				X			X	
	REGION X				X	X	X	X	

STATES AND PROVINCES MENTIONED: CA, CO, ID, OR, UT, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (202, 235, 233) SPEC. COND. 21.8 - 197; TOT. RESIDUE 50 - 114; TOT. DISS. SOLIDS 100; TOT. ORG. C 0.6 - 4.7; Ca-Mg HARDNESS 22 - 74; NON-CARBONATE HARDNESS 0 - 10; TOT. HARDNESS 15 - 95; Ca 0.82 - 18; Mg 0.62 - 7.1; Na 1.37 - 9.4; K 0.6 - 1.8; Fe 0.09; HCO_3 32 - 78; F 0 - 0.3; SO_4 3.0 - 10; Cl 2.0 - 14.0; B 0 - 0.06

(2, 69, 202, 235, 233) ELEVATION 100 - 3450 METERS

Rhyacophilidae *Rhyacophila invaria* (Walker)

	SOURCE / PARAMETERS		126	244	259	207	166	NOTES OR RANGES
	LARVAE		X	X		X	X	
	ADULT				X			
GENERAL HABITAT	LAKE/POND				X			
	RIVER							
	STREAM		X	X		X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON	X					
	EMBENTHIC	IN						
	EPILITHIC	ROCK						
	EPIPHYTIC	PLANT	X					
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY							
	CURRENT							
TEMP.	EUTHERMAL	>30C						
	MESOTHERMAL	15-30C		X			X	0 - 17.5
	OLIGOTHERMAL	<15C		X		X	X	
	STENOTHERMAL	<5C		X			X	
PH	ACIDOBIONTIC	<5.5				X	X	4.2
	ACIDOPHILIC	<7.0		X			X	6.9
	ALKALIPHILOUS	>=7.0						
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.					X	ALMOST COMPLETE
		MG/L		X				7.0 - 11.4
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL		X		X		0 - 6.5
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO						
		TOTAL						
	SEASONAL	L	X			X		MARCH - JULY
	DISTRIBUTION	A			X			JULY
GEOGRAPHIC DISTRIBUTION	REGION I		X			X	X	
	REGION II				X			
	REGION III					X		
	REGION IV			X		X		
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: NC, NH, NY, PA, WV, VA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244, 207) SPEC. COND. 8 - 51; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; SO_4 ND - 5.8; Ca 0 - 6; Mg 18 - 22; ELEVATION 2015 - 3500 FT

Rhyacophilidae *Rhyacophila lobifera* (Betten)

	SOURCE PARAMETERS	210	4	13	121	188	237	167	276	NOTES OR RANGES
	LARVAE	X	X	X	X	X	X	X	X	
	ADULT	X								
GENERAL HABITAT	LAKE/POND									
	RIVER		X	X	X			X		
	STREAM	X				X	X		X	
	SPRING						X			
	TEMP. WATERS	X							X	
SPECIFIC HABITAT	EPIBENTHIC ON						X			
	EMBENTHIC IN									
	EPILITHIC ROCK									
	EPIPHYTIC PLANT						X			
	OTHER									
HOME	RETREAT BUILDER									
	CASE MAKER									
	FREELIVING									
DIET	CARNIVORE									
	HERBIVORE									
	OMNIVORE						X			
	DETRITIVORE									
	TURBIDITY		X	X						SEE COMMENTS
	CURRENT								X	0 - 50 CM/S
TEMP.	EUTHERMAL >30C									1.5 - 24.1
	MESOTHERMAL 15-30C		X				X		X	
	OLIGOTHERMAL <15C		X	X			X		X	
	STENOTHERMAL <5C								X	
PH	ACIDOBIONTIC <5.5									
	ACIDOPHILIC <7.0									
	ALKALIPHILOUS >=7.0		X	X		X	X	X		7.0
	ALKALIBIONTIC >8.5								X	9.4
DO	DISS. OXYGEN % SAT.		X	X		X		X		59 - 150
	MG/L		X		X		X			5.6 - 15.8
H$_2$O CHEMISTRY	ALKALINITY PHTH.			X						0 - 2
	TOTAL		X	X			X	X		26.7 - 195
	NITRATES		X	X			X			0.18 - 1.8
	NITRITES		X	X						0.000 - 0.033
	AMMONIA		X	X						0.01 - 0.70
	PHOSPHORUS ORTHO		X	X						0.0 - 0.099
	TOTAL		X							0.034 - 0.36
	SEASONAL L		X	X	X	X	X		X	JAN. - DEC.
	DISTRIBUTION A	X								APRIL - JUNE
GEOGRAPHIC DISTRIBUTION	REGION I									
	REGION II									
	REGION III									
	REGION IV					X	X			
	REGION V	X			X			X		
	REGION VI	X								
	REGION VII		X	X						
	REGION VIII									
	REGION IX									
	REGION X									

STATES AND PROVINCES MENTIONED: IL, IN, OH, OK, ONT., KS, KY, TN

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (4, 13, 237, 167) TRUE COLOR 7 - 52 UNITS: TOT. COLIFORMS 2 - 3/100 ML; FECAL COLIFORMS 10 - 290/100 ML; DETERGENTS as ABS 0.1; FREE CO_2 0.0 - 8.5; SPEC. COND. 280 - 350; TOT. SUSP. AND DISS. SOLIDS 652; COD 13 - 37; ORG. C 6.8 - 30; BOD 0.4 - 3.5; TOT. HARDNESS as $CaCO_3$ 68 - 240; Ca HARDNESS 51.0 - 68.0; HEXANE SOL. MATERIALS 0.5 - 2.3; Ca 100 - 110; Mg 40 - 88; Si 0.30 - 8.5; Fe 0.05 - 11.0; Mn 0.01 - 0.22; Na 6.2; K 2.3; SO_4 24 - 99; Cl 4.2; F 0.2; Cu 1.5 - 10 μG/L; Pb 1.0 - 9.0 μG/L; Hg 0.45 - 6.7 μG/L; Zn 1.6 - 52 μG/L

(4) FOUND IN SLOW CURRENT, RIVER GRADIENT RARELY EXCEEDED 1M/KM

(188) ASSOSIATED WITH FOLLOWING ALGAE: *Lemanea*, *Cladophora*, *Phormidium*.

(276) SUMMER POOLS BECAME ENRICHED WITH CATTLE WASTES, POOLS THEN WERE STAGNENT.

Rhyacophilidae *Rhyacophila malkini* Ross

	SOURCE / PARAMETERS	10	235	NOTES OR RANGES
	LARVAE			
	ADULT	X		
GENERAL HABITAT	LAKE/POND			
	RIVER	X	X	
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON			
	EMBENTHIC IN			
	EPILITHIC ROCK			
	EPIPHYTIC PLANT			
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING	X		
DIET	CARNIVORE	X		
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	0.3 - 180 NTU
	CURRENT			
TEMP.	EUTHERMAL >30C			2.6 - 26
	MESOTHERMAL 15-30C		X	
	OLIGOTHERMAL <15C		X	
	STENOTHERMAL <5C		X	
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0		X	6.0
	ALKALIPHILOUS >=7.0		X	8.2
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.			
	MG/L			
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL			
	NITRATES		X	<0.05 - 0.5
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO		X	<0.02 - 0.05
	TOTAL		X	0.02 - 0.86
	SEASONAL L			
	DISTRIBUTION A	X		JULY - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X	X	X	

STATES AND PROVINCES MENTIONED: OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 197; TOT. KJ. N 0.03 - 0.22; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.1 - 5.1; Ca-Mg HARDNESS 21 - 74; NON-CARBONATE HARDNESS 0 - 10; Si 9.1 - 47.6; Fe 0 - 0.71; Ca 5.4 - 18; Mg 1.4 - 7.1; B 0 - 0.06; Na 3.0 - 8.4; K 0.4 - 1.8; HCO_3 30 - 78; F 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 14

Rhyacophilidae *Rhyacophila melita* Ross

	SOURCE		157	207	NOTES OR RANGES
	PARAMETERS				
	LARVAE				
	ADULT		X		(207) PUPAE
GENERAL HABITAT	LAKE/POND		X		
	RIVER		X		
	STREAM			X	
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON			
	EMBENTHIC	IN			
	EPILITHIC	ROCK			
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY				
	CURRENT				
TEMP.	EUTHERMAL	>30C			
	MESOTHERMAL	15-30C			
	OLIGOTHERMAL	<15C		X	12
	STENOTHERMAL	<5C			
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0			
	ALKALIPHILOUS	>=7.0		X	7.0
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL		X	48
	NITRATES				
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO			
		TOTAL			
	SEASONAL DISTRIBUTION	L			
		A	X		JUNE - JULY
GEOGRAPHIC DISTRIBUTION	REGION I			X	
	REGION II			X	
	REGION III				
	REGION IV				
	REGION V		X	X	
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: MI, NH, NY, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (207) TOT. HARDNESS as $CaCO_3$ 72; SPEC. COND. 150; Ca 34; Mg 38; ELEVATION 600 FT

Rhyacophilidae *Rhyacophila minora* Banks

	SOURCE / PARAMETERS		36	168	283	244	207	NOTES OR RANGES
	LARVAE			X	X	X	X	
	ADULT		X					
GENERAL HABITAT	LAKE/POND							
	RIVER							
	STREAM			X	X	X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC	ON		X	X			
	EMBENTHIC	IN						
	EPILITHIC	ROCK						
	EPIPHYTIC	PLANT		X	X			
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY				X			0 - 26
	CURRENT							
TEMP.	EUTHERMAL	>30C						2 - 18.5
	MESOTHERMAL	15-30C			X	X		
	OLIGOTHERMAL	<15C		X	X	X	X	
	STENOTHERMAL	<5C		X	X	X		
PH	ACIDOBIONTIC	<5.5					X	3.8
	ACIDOPHILIC	<7.0			X	X		6.9
	ALKALIPHILOUS	>=7.0						
	ALKALIBIONTIC	>8.5						
DO	DISS. OXYGEN	% SAT.						
		MG/L			X	X		7.0 - 13.8
H_2O CHEMISTRY	ALKALINITY	PHTH.						
		TOTAL			X	X	X	0 - 10.0
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS	ORTHO						
		TOTAL			X			4.05 - 9.84 uG/L
	SEASONAL	L		X			X	JAN. - DEC.
	DISTRIBUTION	A	X					JUNE
GEOGRAPHIC DISTRIBUTION	REGION I		X					
	REGION II							
	REGION III					X		
	REGION IV				X	X	X	
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X							

STATES AND PROVINCES MENTIONED: NC, NH, QUE., WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 244, 207) SPEC. COND. 8 - 51; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 28; SO_4 ND - 5.8; Ca 0.470 - 6; Mg 0.213 - 6; K 0.431 - 0.616; Na 0.639 - 1.125; ELEVATION 3125 FT

Rhyacophilidae *Rhyacophila nigrita* Banks

	SOURCE / PARAMETERS		189	283	244	207	NOTES OR RANGES
	LARVAE		X	X	X	X	
	ADULT						
GENERAL HABITAT	LAKE/POND						
	RIVER						
	STREAM		X	X	X	X	
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON		X			
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT		X			
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY			X			0 - 26
	CURRENT						
TEMP.	EUTHERMAL	>30C					2 - 18.5
	MESOTHERMAL	15-30C		X	X		
	OLIGOTHERMAL	<15C		X	X	X	
	STENOTHERMAL	<5C		X	X		
PH	ACIDOBIONTIC	<5.5				X	4.8
	ACIDOPHILIC	<7.0		X	X	X	
	ALKALIPHILOUS	>7.0				X	7.4
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L		X	X		7.0 - 13.8
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL	X	X	X	X	ND - 24
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL		X			4.05 - 9.84 uG/L
	SEASONAL	L				X	MAY - JUNE
	DISTRIBUTION	A					
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II					X	
	REGION III		X			X	
	REGION IV		X	X	X	X	
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: GA, KY, NC, NY, TN, VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 244, 207) SPEC. COND. 8 - 70; PHTH. ACIDITY as $CaCO_3$ 1.5 - 5.0; TOT. HARDNESS as $CaCO_3$ 7 - 52; SO_4 ND - 5.8; Ca 0 - 24; Mg 0.213 - 28; K 0.431 - 0.616; Na 0.639 - 1.125; ELEVATION 1850 - 3280 FT

(189) FOUND IN STREAM TYPICALLY OF HIGHER RELATIVE NUTRIENT CONTENT, LESS AQUATIC VEGETATION, AND <50 MG/L HARDNESS

Rhyacophilidae *Rhyacophila norcuta* Ross

	SOURCE PARAMETERS	69	10	235	209	217	233																NOTES OR RANGES
	LARVAE		X																				
	ADULT	X	X		X	X																	
GENERAL HABITAT	LAKE/POND																						
	RIVER			X																			
	STREAM		X				X																
	SPRING																						
	TEMP. WATERS		X																				
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING		X																				
DIET	CARNIVORE		X																				
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY		X																				0.5 - 180 NTU
	CURRENT																						
TEMP.	EUTHERMAL >30C																						6 - 26
	MESOTHERMAL 15-30C		X																				
	OLIGOTHERMAL <15C		X																				
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0																						
	ALKALIPHILOUS >=7.0		X																				7.2 - 7.9
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.																						
	MG/L																						
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL																						
	NITRATES		X																				0.05 - 0.5
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL		X																				0.02 - 0.19
	SEASONAL DISTRIBUTION L																						
	A	X	X		X																		MAY - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII																						
	REGION IX	X	X			X	X																
	REGION X	X	X	X	X	X																	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, ID, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 59 - 197; TOT. RESIDUE 50 - 114; TOT. ORG. C 0.6 - 4.7; Ca-Mg HARDNESS 22 - 74; NON- CARBONATE HARDNESS 0 - 10; Si 9.4 - 16.0; Fe 0.09; Ca 5.4 - 18; Mg 2.1 - 7.1; Na 3.0 - 9.4; K 0.6 - 1.8; HCO_3 32 - 78; F 0 - 0.3; SO_4 3.0 - 10; Cl 2.0 - 14.0; B 0 - 0.06

Rhyacophilidae *Rhyacophila oreta* Ross

	SOURCE / PARAMETERS	5	69	10	217	233	NOTES OR RANGES
	LARVAE	X		X		X	
	ADULT	X	X	X	X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X				X	
	STREAM	X				X	
	SPRING			X		X	
	TEMP. WATERS			X			
SPECIFIC HABITAT	EPIBENTHIC ON	X		X			
	EMBENTHIC IN			X			
	EPILITHIC ROCK	X		X			
	EPIPHYTIC PLANT	X		X			
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING	X		X			
DIET	CARNIVORE	X		X		X	
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY	X				X	0.2 - 3.6
	CURRENT	X					71 CM/S
TEMP.	EUTHERMAL >30C						6 - 13.5
	MESOTHERMAL 15-30C						
	OLIGOTHERMAL <15C	X					
	STENOTHERMAL <5C						
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0						
	ALKALIPHILOUS >=7.0	X				X	7.2 - 8.5
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.					X	90 - 116
	MG/L					X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL	X				X	15 - 95
	NITRATES	X					0.01 - 0.05
	NITRITES						
	AMMONIA						
	PHOSPHORUS ORTHO	X					0.2 - 0.57
	TOTAL						
	SEASONAL L					X	JUNE
	DISTRIBUTION A	X	X	X	X	X	APRIL - DECEMBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII		X	X	X	X	
	REGION IX		X	X	X	X	
	REGION X	X	X	X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, OR, UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 233) SPEC. COND. 92 - 118; TOT. HARDNESS as $CaCO_3$ 15 - 95; TOT. DISS. SOLIDS <100; Ca 5.9 - 8; MEAN STREAM WIDTH 30.5 M; MEAN DEPTH 21.3 CM

Rhyacophilidae *Rhyacophila pellisa* Ross

	SOURCE PARAMETERS	5	6	69	109	209	233	NOTES OR RANGES
	LARVAE	X						
	ADULT	X	X	X	X	X	X	
GENERAL HABITAT	LAKE/POND							
	RIVER	X			X		X	
	STREAM	X			X		X	
	SPRING				X			
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON	X					X	
	EMBENTHIC IN							
	EPILITHIC ROCK	X						
	EPIPHYTIC PLANT	X					X	
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING	X						
DIET	CARNIVORE	X						
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY	X					X	0.2 - 3.6
	CURRENT	X						71 CM/S
TEMP.	EUTHERMAL >30C							6 - 13.5
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C	X	X					
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0	X					X	7.2 - 8.5
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.						X	9.0 - 11.5
	MG/L						X	90 - 116
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL	X					X	15 - 90
	NITRATES	X						0.01 - 0.05
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO	X						0.2 - 0.57
	TOTAL							
	SEASONAL L							
	DISTRIBUTION A	X	X	X	X	X	X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII			X	X	X	X	
	REGION IX				X		X	
	REGION X	X	X		X		X	

STATES AND PROVINCES MENTIONED: ALB., CO, CA, ID, OR, UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 233) SPEC. COND. 92 - 118; TOT. HARDNESS as $CaCO_3$ 15 - 95; Ca 5.9 - 8;MEAN STREAM WIDTH 30.5 M; MEAN DEPTH 21.3 CM (233) LARVAE UNKNOWN

Rhyacophilidae *Rhyacophila rotunda* Banks

	SOURCE	233	69	NOTES OR RANGES
	PARAMETERS			
	LARVAE	X		
	ADULT	X	X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM	X		
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC ON	X		
	EMBENTHIC IN	X		
	EPILITHIC ROCK	X		
	EPIPHYTIC PLANT			
	OTHER	X		MUD
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY	X		CLOSE TO 0
	CURRENT			
TEMP.	EUTHERMAL >30C			
	MESOTHERMAL 15-30C			
	OLIGOTHERMAL <15C			
	STENOTHERMAL <5C			
PH	ACIDOBIONTIC <5.5			
	ACIDOPHILIC <7.0			
	ALKALIPHILOUS >=7.0	X		7.2 - 8.5
	ALKALIBIONTIC >8.5			
DO	DISS. OXYGEN % SAT.	X		90 - 116
	MG/L	X		9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.			
	TOTAL	X		15 - 95
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS ORTHO			
	TOTAL			
	SEASONAL L	X		MARCH - JUNE
	DISTRIBUTION A	X	X	MARCH - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII	X		
	REGION VIII	X	X	
	REGION IX		X	
	REGION X	X		

STATES AND PROVINCES MENTIONED: CA, NV, UT

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) TOT. HARDNESS as $CaCO_3$ 15 - 95; TOT. DISS. SOLIDS <100; ELEVATION 1750 FT

(69) ELEVATION 4500 - 5000 FT

Rhyacophila shenandoahensis Flint

	SOURCE	207	NOTES OR RANGES
	PARAMETERS		
	LARVAE	X	
	ADULT		
GENERAL HABITAT	LAKE/POND		
	RIVER		
	STREAM	X	
	SPRING		
	TEMP. WATERS		
SPECIFIC HABITAT	EPIBENTHIC ON		
	EMBENTHIC IN		
	EPILITHIC ROCK		
	EPIPHYTIC PLANT		
	OTHER		
HOME	RETREAT BUILDER		
	CASE MAKER		
	FREELIVING		
DIET	CARNIVORE		
	HERBIVORE		
	OMNIVORE		
	DETRITIVORE		
	TURBIDITY		
	CURRENT		
TEMP.	EUTHERMAL >30C		8 - 10
	MESOTHERMAL 15-30C		
	OLIGOTHERMAL <15C	X	
	STENOTHERMAL <5C		
PH	ACIDOBIONTIC <5.5	X	
	ACIDOPHILIC <7.0	X	
	ALKALIPHILOUS >=7.0		
	ALKALIBIONTIC >8.5		
DO	DISS. OXYGEN % SAT.		
	MG/L		
H_2O CHEMISTRY	ALKALINITY PHTH.		
	TOTAL	X	
	NITRATES		
	NITRITES		
	AMMONIA		
	PHOSPHORUS ORTHO		
	TOTAL		
	SEASONAL L	X	MAY - JULY
	DISTRIBUTION A		
GEOGRAPHIC DISTRIBUTION	REGION I	X	
	REGION II		
	REGION III	X	
	REGION IV	X	
	REGION V		
	REGION VI		
	REGION VII		
	REGION VIII		
	REGION IX		
	REGION X		

STATES AND PROVINCES MENTIONED: NH, PA, VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (207) TOT. HARDNESS as $CaCO_3$ 36 - 52; SPEC. COND. 45 - 70; Ca 8 - 24; Mg 28 - 32; ELEVATION 1850 - 3280 FT

Rhyacophilidae *Rhyacophila torva* Hagen

	SOURCE	5	69	283	233	NOTES OF RANGES
	PARAMETERS					
	LARVAE			X	X	
	ADULT	X	X			
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM			X		
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC ON			X	X	
	EMBENTHIC IN					
	EPILITHIC ROCK					
	EPIPHYTIC PLANT			X	X	
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY			X		0 - 26
	CURRENT					
TEMP.	EUTHERMAL >30C					2 - 24
	MESOTHERMAL 15-30C			X	X	
	OLIGOTHERMAL <15C			X	X	
	STENOTHERMAL <5C			X		
PH	ACIDOBIONTIC <5.5				X	3.8
	ACIDOPHILIC <7.0			X	X	
	ALKALIPHILOUS >=7.0				X	7.0
	ALKALIBIONTIC >8.5					
DO	DISS. OXYGEN % SAT.					
	MG/L			X		8 - 13.8
H_2O CHEMISTRY	ALKALINITY PHTH.					
	TOTAL			X	X	0 - 168
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS ORTHO					
	TOTAL			X		4.05 - 9.84 uG/L
	SEASONAL L				X	MAY - JUNE
	DISTRIBUTION A	X	X			MAY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I	X	X		X	
	REGION II				X	
	REGION III		X		X	
	REGION IV		X	X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: MA, NC, NH, NY, TN ,VA, VT, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (283, 233) SPEC. COND. 8.7 - 515; TOT. HARDNESS as $CaCO_3$ 12 - 252; Ca 0.470 - 144; Mg 0.213 - 108; K 0.431 - 0.616; Na 0.639 - 1.125; ELEVATION 400 - 3280 FT

(69) ELEVATION 4650 FT

Rhyacophilidae *Rhyacophila tucula* Ross

	SOURCE	5	10	11	217	233	NOTES OR RANGES
	PARAMETERS						
	LARVAE	X	X	X		X	
	ADULT	X	X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER	X					
	STREAM	X	X	X	X	X	
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC .ON	X				X	
	EMBENTHIC IN						
	EPILITHIC ROCK	X				X	
	EPIPHYTIC PLANT	X				X	
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING	X	X				
DIET	CARNIVORE	X	X				
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY	X		X		X	0.2 - 4.0
	CURRENT						
TEMP.	EUTHERMAL >30C						4 - 15.5
	MESOTHERMAL 15-30C			X			
	OLIGOTHERMAL <15C	X		X			
	STENOTHERMAL <5C			X			
PH	ACIDOBIONTIC <5.5						
	ACIDOPHILIC <7.0					X	6.6
	ALKALIPHILOUS >=7.0	X		X			8.5
	ALKALIBIONTIC >8.5						
DO	DISS. OXYGEN % SAT.					X	90 - 116
	MG/L					X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.						
	TOTAL	X		X		X	15 - 196
	NITRATES	X					0.01 - 0.05
	NITRITES						
	AMMONIA						
	PHOSPHORUS ORTHO	X					0.2 - 0.57
	TOTAL						
	SEASONAL L					X	JULY
	DISTRIBUTION A	X	X		X	X	MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII		X	X	X	X	
	REGION IX						
	REGION X	X	X		X	X	

STATES AND PROVINCES MENTIONED: AK, BRIT, COL., ID, MT, OR, UT, WA, WY

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 1, 233) SPEC. COND. 92 - 118; TOT. HARDNESS as $CaCO_3$ 15 - 314; TOT. DISS. SOLIDS 100; Ca 5.9 - 8; MEAN STEAM DEPTH 21.3 CM; MEAN WIDTH 30.5 M

Rhyacophilidae *Rhyacophila vaccua* Milne

	SOURCE PARAMETERS	6	69	10	202	242	259	217	243	233	NOTES OR RANGES
	LARVAE				X	X			X	X	
	ADULT	X	X	X			X	X	X	X	
GENERAL HABITAT	LAKE/POND										
	RIVER									X	
	STREAM	X		X	X	X	X		X	X	
	SPRING										
	TEMP. WATERS										
SPECIFIC HABITAT	EPIBENTHIC ON									X	
	EMBENTHIC IN										
	EPILITHIC ROCK									X	
	EPIPHYTIC PLANT										
	OTHER										
HOME	RETREAT BUILDER										
	CASE MAKER										
	FREELIVING			X							
DIET	CARNIVORE			X							
	HERBIVORE										
	OMNIVORE										
	DETRITIVORE										
	TURBIDITY										
	CURRENT										
TEMP.	EUTHERMAL >30C										8 - 20
	MESOTHERMAL 15-30C				X						
	OLIGOTHERMAL <15C	X			X						
	STENOTHERMAL <5C										
PH	ACIDOBIONTIC <5.5										
	ACIDOPHILIC <7.0				X					X	6.6
	ALKALIPHILOUS >=7.0				X					X	8.5
	ALKALIBIONTIC >8.5										
DO	DISS. OXYGEN % SAT.									X	90 - 116
	MG/L									X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.										
	TOTAL				X					X	11 - 95
	NITRATES										
	NITRITES										
	AMMONIA										
	PHOSPHORUS ORTHO										
	TOTAL										
	SEASONAL L				X	X				X	JAN. - DEC.
	DISTRIBUTION A	X	X	X			X	X	X	X	MARCH - DECEMBER
GEOGRAPHIC DISTRIBUTION	REGION I										
	REGION II										
	REGION III										
	REGION IV										
	REGION V										
	REGION VI										
	REGION VII										
	REGION VIII			X						X	
	REGION IX			X						X	
	REGION X	X		X	X	X	X		X	X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, ID, MT, OR, WA, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (202, 233) SPEC. COND. 18.7 - 119; TOT. DISS. SOLIDS < 100; Ca 0.63 - 22.4; Mg 0.33 - 5.56; Na 1.08 - 5.29; K 0.41 - 4.30

(243) SHOWED NO PREFERENCE FOR EITHER 1.0 OR 1.75 FT/S CURRENT

(6, 202, 243, 233) ELEVATION 650 - 10,000 FT

(217) WIDESPREAD THROUGH NORTHWESTERN MONTANE REGION

Rhyacophilidae *Rhyacophila vaefes* Milne

	SOURCE PARAMETERS	5	69	10	242	217	243	NOTES OR RANGES
	LARVAE	X		X	X		X	
	ADULT	X	X	X		X	X	
GENERAL HABITAT	LAKE/POND							
	RIVER	X						
	STREAM	X					X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON	X						
	EMBENTHIC IN							
	EPILITHIC ROCK	X						
	EPIPHYTIC PLANT	X						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING	X		X				
DIET	CARNIVORE	X						
	HERBIVORE							
	OMNIVORE			X			X	
	DETRITIVORE							
	TURBIDITY	X						0.2 - 3.6
	CURRENT	X						71 CM/S
TEMP.	EUTHERMAL >30C							6 - 13.5
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C	X						
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0							
	ALKALIPHILOUS >=7.0	X						7.3 - 7.6
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.							
	MG/L							
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL	X						53 - 58
	NITRATES	X						0.01 - 0.05
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO	X						0.2 - 0.57
	TOTAL							
	SEASONAL L				X			NOV. - DEC.
	DISTRIBUTION A	X	X	X		X	X	APRIL - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X	X	X	X		X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5) SPEC. COND 92 - 118; TOT. HARDNESS as $CaCO_3$ 41.2 - 48.8; Ca 5.9 - 8; MEAN DEPTH 21.3 CM; MEAN STREAM WIDTH 30.5 M

(243) ELEVATION 1200 FT

(242) MAXIMUM LARVAL DENSITY IN NOVEMBER AND DECEMBER

Rhyacophilidae *Rhyacophila vagrita* Milne

	SOURCE PARAMETERS	69	10	202	242	1	217	243	233														NOTES OR RANGES
	LARVAE			X	X	X		X	X														
	ADULT	X					X	X															
GENERAL HABITAT	LAKE/POND																						
	RIVER																						
	STREAM		X	X	X	X		X															
	SPRING		X																				
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON																						
	EMBENTHIC IN																						
	EPILITHIC ROCK																						
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING		X																				
DIET	CARNIVORE		X					X															
	HERBIVORE																						
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY					X																	1.0
	CURRENT					X		X															0.65 - 1.25 M/S
TEMP.	EUTHERMAL >30C																						4 - 22
	MESOTHERMAL 15-30C			X																			
	OLIGOTHERMAL <15C			X		X																	
	STENOTHERMAL <5C					X																	
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0								X														6.6
	ALKALIPHILOUS >=7.0			X		X			X														8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.								X														90 - 116
	MG/L								X														9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL			X		X			X														10 - 134
	NITRATES																						
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL																						
	SEASONAL L		X	X	X				X														APRIL - SEPTEMBER
	DISTRIBUTION A	X	X		X		X	X															AUGUST - NOVEMBER
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII		X			X			X														
	REGION IX		X						X														
	REGION X		X	X	X			X															

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., CA, ID, MT, OR, UT, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (202, 1, 233) SPEC. COND. 21.8 - 114; TOT. HARDNESS as $CaCO_3$ 15 - 196; TOT. SOLIDS 100; Ca 0.69 - 22.4; Mg 0.45 - 5.56; Na 1.37 - 2.93; K 0.39 - 1.06; Zn 0.225

(10, 202, 243, 233) ELEVATION 1200 - 7600 FT

Rhyacophilidae *Rhyacophila vao* Milne

	SOURCE PARAMETERS	6	69	10	259	217	233	NOTES OR RANGES
	LARVAE						X	
	ADULT	X	X	X	X	X	X	
GENERAL HABITAT	LAKE/POND							
	RIVER					X		
	STREAM	X		X	X		X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON							
	EMBENTHIC IN							
	EPILITHIC ROCK							
	EPIPHYTIC PLANT							
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING							
DIET	CARNIVORE							
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY							
	CURRENT							
TEMP.	EUTHERMAL >30C							12.2
	MESOTHERMAL 15-30C							
	OLIGOTHERMAL <15C	X						
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0						X	6.6
	ALKALIPHILOUS >=7.0	X					X	8.5
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.						X	90 - 116
	MG/L						X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL						X	15 - 220
	NITRATES							
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO							
	TOTAL							
	SEASONAL DISTRIBUTION L							
	A	X	X	X	X	X	X	MARCH - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII							
	REGION IX							
	REGION X		X	X	X	X	X	

STATES AND PROVINCES MENTIONED: AK, BRIT. COL., OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) TOT. DISS. SOLIDS 100; TOT. HARDNESS as $CaCO_3$ 15 - 220

(6, 233) ELEVATION 500 - 6000 FT

Rhyacophilidae *Rhyacophila vepulsa* Milne

	SOURCE	5	69	202	217	243	233	NOTES OR RANGES
	PARAMETERS							
	LARVAE	X		X		X	X	
	ADULT	X	X		X	X	X	
GENERAL HABITAT	LAKE/POND							
	RIVER	X			X		X	
	STREAM	X		X	X	X	X	
	SPRING							
	TEMP. WATERS							
SPECIFIC HABITAT	EPIBENTHIC ON	X					X	
	EMBENTHIC IN							
	EPILITHIC ROCK	X					X	
	EPIPHYTIC PLANT	X						
	OTHER							
HOME	RETREAT BUILDER							
	CASE MAKER							
	FREELIVING	X						
DIET	CARNIVORE	X						
	HERBIVORE							
	OMNIVORE							
	DETRITIVORE							
	TURBIDITY	X					X	0.2 - 3.6
	CURRENT	X						
TEMP.	EUTHERMAL >30C							6 - 16
	MESOTHERMAL 15-30C			X				
	OLIGOTHERMAL <15C	X						
	STENOTHERMAL <5C							
PH	ACIDOBIONTIC <5.5							
	ACIDOPHILIC <7.0						X	6.6
	ALKALIPHILOUS >=7.0	X					X	8.5
	ALKALIBIONTIC >8.5							
DO	DISS. OXYGEN % SAT.						X	90 - 116
	MG/L						X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.							
	TOTAL	X		X			X	15 - 95
	NITRATES	X						0.01 - 0.05
	NITRITES							
	AMMONIA							
	PHOSPHORUS ORTHO	X						0.2 - 0.57
	TOTAL							
	SEASONAL L			X			X	APRIL - AUGUST
	DISTRIBUTION A	X	X		X	X	X	APRIL - SEPTEMBER
GEOGRAPHIC DISTRIBUTION	REGION I							
	REGION II							
	REGION III							
	REGION IV							
	REGION V							
	REGION VI							
	REGION VII							
	REGION VIII						X	
	REGION IX		X		X		X	
	REGION X	X	X	X	X	X	X	

STATES AND PROVINCES MENTIONED: AK, BRIT. COL., CA, ID, MT, OR, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (5, 202, 233) SPEC. COND. 92 - 118; TOT. HARDNESS as $CaCO_3$ 15 - 95; TOT. DISS. SOLIDS <100; Ca 5.9 - 8; MEAN STREAM DEPTH 21.3 CM; MEAN WIDTH 30.5 M; Mg 2.63; Na 5.29; K 4.30

(202, 217, 243, 233) ELEVATION 1200 - 6200 FT

Rhyacophilidae *Rhyacophila verrula* Milne

	SOURCE	2	69	10	202	242	68	259	217	243	233												NOTES OR RANGES
	PARAMETERS																						
	LARVAE	X			X	X				X	X												
	ADULT		X	X		X		X	X	X	X												
GENERAL HABITAT	LAKE/POND																						
	RIVER							X-			X												
	STREAM	X			X	X	X			X	X												
	SPRING																						
	TEMP. WATERS																						
SPECIFIC HABITAT	EPIBENTHIC ON										X												
	EMBENTHIC IN																						
	EPILITHIC ROCK										X												
	EPIPHYTIC PLANT																						
	OTHER																						
HOME	RETREAT BUILDER																						
	CASE MAKER																						
	FREELIVING			X																			
DIET	CARNIVORE																						
	HERBIVORE	X		X						X	X												
	OMNIVORE																						
	DETRITIVORE																						
	TURBIDITY										X												CLOSE TO 0
	CURRENT																						
TEMP.	EUTHERMAL >30C																						7 - 10
	MESOTHERMAL 15-30C																						
	OLIGOTHERMAL <15C				X																		
	STENOTHERMAL <5C																						
PH	ACIDOBIONTIC <5.5																						
	ACIDOPHILIC <7.0				X																		6.6
	ALKALIPHILOUS >=7.0				X																		8.5
	ALKALIBIONTIC >8.5																						
DO	DISS. OXYGEN % SAT.										X												90 - 116
	MG/L										X												9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY PHTH.																						
	TOTAL				X																		9 - 220
	NITRATES																						
	NITRITES																						
	AMMONIA																						
	PHOSPHORUS ORTHO																						
	TOTAL																						
	SEASONAL L	X			X	X					X												JAN. - DEC.
	DISTRIBUTION A		X	X				X	X		X												MAY - OCTOBER
GEOGRAPHIC DISTRIBUTION	REGION I																						
	REGION II																						
	REGION III																						
	REGION IV																						
	REGION V																						
	REGION VI																						
	REGION VII																						
	REGION VIII	X	X	X			X				X												
	REGION IX			X							X												
	REGION X		X	X	X	X		X		X	X												

STATES AND PROVINCES MENTIONED: ALB., AK, BRIT. COL., CA, CO, ID, MT, OR, UT, WA, WY, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (202, 233) SPEC. COND. 19.2 - 114; TOT. HARDNESS as $CaCO_3$ 15 - 220; TOT. SOLIDS <100 - 300; Ca 0.54 - 22.4; Mg 0.20 - 5.56; Na 1.45 - 1.68; K 0.71 - 1.06

(2, 202, 68, 243,233) ELEVATION 1200 - 10,500 FT

(217) WIDESPREAD THROUGHOUT THE WESTERN MONTANE REGION

(68) RAPID MOUNTAIN STREAM

Rhyacophilidae *Rhyacophila vibox* Milne

	SOURCE		210	168	157	207	NOTES OR RANGES
	PARAMETERS						
	LARVAE		X	X		X	
	ADULT		X		X		
GENERAL HABITAT	LAKE/POND				X		
	RIVER						
	STREAM			X		X	
	SPRING		X				
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON		X			
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT		X			
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER						
	FREELIVING						
DIET	CARNIVORE						
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY						
	CURRENT						
TEMP.	EUTHERMAL	>30C					1 - 15
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C		X		X	
	STENOTHERMAL	<5C		X			
PH	ACIDOBIONTIC	<5.5				X	4.2 - 4.8
	ACIDOPHILIC	<7.0					
	ALKALIPHILOUS	>=7.0					
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.					
		MG/L					
H_2O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL					
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL	L		X		X	JAN. - DEC.
	DISTRIBUTION	A			X		JUNE
GEOGRAPHIC DISTRIBUTION	REGION I					X	
	REGION II						
	REGION III					X	
	REGION IV					X	
	REGION V		X				
	REGION VI						
	REGION VII						
	REGION VIII						
	REGION IX						
	REGION X						

STATES AND PROVINCES MENTIONED: IL, NH, ONT., PA, QUE., VA, WV

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (207) TOT. HARDNESS as $CaCO_3$ 22 - 24; SPEC. COND. 12 - 48; Ca 0 - 6; Mg 18 - 22; ELEVATION 2015 - 3500 FT

Rhyacophilidae *Rhyacophila vobara* Milne

	SOURCE		69	217	233	NOTES OR RANGES
	PARAMETERS					
	LARVAE					
	ADULT		X	X	X	
GENERAL HABITAT	LAKE/POND					
	RIVER				X	
	STREAM					
	SPRING					
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN				
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER					
HOME	RETREAT BUILDER					
	CASE MAKER					
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE					
	OMNIVORE					
	DETRITIVORE					
	TURBIDITY				X	CLOSE TO 0
	CURRENT					
TEMP.	EUTHERMAL	>30C				
	MESOTHERMAL	15-30C				
	OLIGOTHERMAL	<15C				
	STENOTHERMAL	<5C				
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0			X	6.6
	ALKALIPHILOUS	>=7.0			X	8.5
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.			X	90 - 116
		MG/L			X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL			X	15 - 95
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL				
	SEASONAL	L				
	DISTRIBUTION	A	X	X	X	JULY - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV					
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X				X	

STATES AND PROVINCES MENTIONED: ALB., BRIT. COL., ID, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) TOT. HARDNESS as $CaCO_3$ 15 - 95 (69) ELEVATION 6000 FT

4 OF 4

PB

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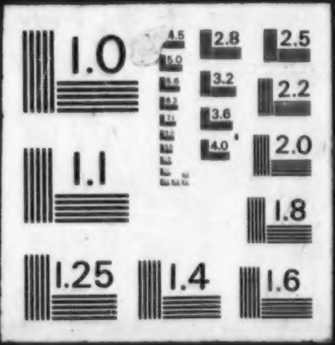
1.0
4.5
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4.0
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1.8
1.25
1.4
1.6

Rhyacophilidae *Rhyacophila vocala* Milne

	SOURCE / PARAMETERS		50	10	217	233	NOTES OR RANGES
	LARVAE					X	
	ADULT		X		X	X	
GENERAL HABITAT	LAKE/POND						
	RIVER					X	
	STREAM			X	X		
	SPRING						
	TEMP. WATERS						
SPECIFIC HABITAT	EPIBENTHIC	ON					
	EMBENTHIC	IN					
	EPILITHIC	ROCK					
	EPIPHYTIC	PLANT					
	OTHER						
HOME	RETREAT BUILDER						
	CASE MAKER			X			
	FREELIVING						
DIET	CARNIVORE			X			
	HERBIVORE						
	OMNIVORE						
	DETRITIVORE						
	TURBIDITY					X	CLOSE TO 0
	CURRENT						
TEMP.	EUTHERMAL	>30C					
	MESOTHERMAL	15-30C					
	OLIGOTHERMAL	<15C					
	STENOTHERMAL	<5C					
PH	ACIDOBIONTIC	<5.5					
	ACIDOPHILIC	<7.0				X	6.6
	ALKALIPHILOUS	>7.0				X	8.5
	ALKALIBIONTIC	>8.5					
DO	DISS. OXYGEN	% SAT.				X	90 - 116
		MG/L				X	9.0 - 11.5
H$_2$O CHEMISTRY	ALKALINITY	PHTH.					
		TOTAL				X	15 - 220
	NITRATES						
	NITRITES						
	AMMONIA						
	PHOSPHORUS	ORTHO					
		TOTAL					
	SEASONAL DISTRIBUTION	L					
		A	X	X	X	X	APRIL - AUGUST
GEOGRAPHIC DISTRIBUTION	REGION I						
	REGION II						
	REGION III						
	REGION IV						
	REGION V						
	REGION VI						
	REGION VII						
	REGION VIII			X			
	REGION IX			X			
	REGION X		X	X	X	X	

STATES AND PROVINCES MENTIONED: BRIT. COL., CA, ID, OR, UT, WA

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) TOT. DISS. SOLIDS < 100 - 300
(10, 233) ELEVATION 2300 - 5800 FT
(10) MAY BE EQUAL TO R. *hyalinata*

Rhyacophilidae *Rhyacophila vofixa* Milne

	SOURCE		233	NOTES OR RANGES
	PARAMETERS			
	LARVAE			
	ADULT		X	
GENERAL HABITAT	LAKE/POND			
	RIVER			
	STREAM			
	SPRING			
	TEMP. WATERS			
SPECIFIC HABITAT	EPIBENTHIC	ON		
	EMBENTHIC	IN		
	EPILITHIC	ROCK		
	EPIPHYTIC	PLANT		
	OTHER			
HOME	RETREAT BUILDER			
	CASE MAKER			
	FREELIVING			
DIET	CARNIVORE			
	HERBIVORE			
	OMNIVORE			
	DETRITIVORE			
	TURBIDITY		X	CLOSE TO 0
	CURRENT			
TEMP.	EUTHERMAL	>30C		
	MESOTHERMAL	15-30C		
	OLIGOTHERMAL	<15C		
	STENOTHERMAL	<5C		
PH	ACIDOBIONTIC	<5.5		
	ACIDOPHILIC	<7.0	X	6.6
	ALKALIPHILOUS	>=7.0	X	8.5
	ALKALIBIONTIC	>8.5		
DO	DISS. OXYGEN	% SAT.	X	90 - 116
		MG/L	X	9.0 - 11.5
H_2O CHEMISTRY	ALKALINITY	PHTH.		
		TOTAL	X	15 - 95
	NITRATES			
	NITRITES			
	AMMONIA			
	PHOSPHORUS	ORTHO		
		TOTAL		
	SEASONAL	L		
	DISTRIBUTION	A	X	JULY
GEOGRAPHIC DISTRIBUTION	REGION I			
	REGION II			
	REGION III			
	REGION IV			
	REGION V			
	REGION VI			
	REGION VII			
	REGION VIII			
	REGION IX			
	REGION X		X	

STATES AND PROVINCES MENTIONED: AK, ALB., BRIT. COL., ID, WA, YUKON

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (233) TOT. HARDNESS as $CaCO_3$ 15 - 95

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Rhyacophilidae

Rhyacophila vuphipes Milne

	SOURCE PARAMETERS	69	113	207	NOTES OR RANGES
	LARVAE			X	
	ADULT	X			
GENERAL HABITAT	LAKE/POND				
	RIVER		X		
	STREAM				
	SPRING				
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC ON				
	EMBENTHIC IN				
	EPILITHIC ROCK				
	EPIPHYTIC PLANT				
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER				
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY		X		1.2 - 6.7
	CURRENT				
TEMP.	EUTHERMAL >30C				
	MESOTHERMAL 15-30C		X	X	7.6 - 22.4
	OLIGOTHERMAL <15C		X		
	STENOTHERMAL <5C				
PH	ACIDOBIONTIC <5.5				
	ACIDOPHILIC <7.0		X		6.4
	ALKALIPHILOUS >=7.0		X	X	7.4
	ALKALIBIONTIC >8.5				
DO	DISS. OXYGEN % SAT.		X		94 - 110
	MG/L		X		8.5 - 11.7
H_2O CHEMISTRY	ALKALINITY PHTH.				
	TOTAL		X	X	3.0 - 19.0
	NITRATES		X		0.01 - 0.4
	NITRITES		X		0
	AMMONIA		X		0.0 - 0.4
	PHOSPHORUS ORTHO				
	TOTAL		X		0.03 - 0.19
	SEASONAL DISTRIBUTION L			X	
	A	X			
GEOGRAPHIC DISTRIBUTION	REGION I		X		
	REGION II	X			
	REGION III				
	REGION IV			X	
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X				

STATES AND PROVINCES MENTIONED: GA, MA, NC, NY, SC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (113, 207) SPEC. COND. 23 - 60; TOT. HARDNESS as $CaCO_3$ 10 - 25; Fe 0.05 - 0.32; SO_4 5 - 101 Cl 3.2 - 6.2; Ca 4; Mg 6; ELEVATION 2300 FT

SERICOSTOMATIDAE

There are three genera and twelve species of this family in the United States. Larvae build slightly curved cases of sand grains or small rock fragments. Populations are local in distribution and occur in clean lotic habitats where they often burrow in sand and gravel deposits. We have minimal water quality data for two genera.

1. Genus Agarodes Banks

Two larvae of the nine species of this eastern genus are described. They are taken from sand deposits along lakes and rivers in the North and from sandy springs in the South. We do not have enough data for a profile of any Agarodes species.

2. Genus Fattigia Ross

The only member of this genus Fattigia pele Ross inhabits cool, sandy springs in Region IV. The larvae burrow into the sand. We have minimal water quality data for this species.

3. Genus Gumaga Tsuda

Two species of this genus occur in western United States. The larvae are known from lotic habitats and are collected from both springs and streams. The larvae do not burrow into the substrate as much as other sericostomatids and have longer, more slender cases than Agarodes or Fattigia. We include a profile for one species, G. griseola (McLachlan).

Sericostomatidae *Fattigia pele* (Ross)

	SOURCE		244	275	283	NOTES OR RANGES
	PARAMETERS					
	LARVAE		X	X	X	
	ADULT					
GENERAL HABITAT	LAKE/POND					
	RIVER					
	STREAM		X	X	X	
	SPRING			X		
	TEMP. WATERS					
SPECIFIC HABITAT	EPIBENTHIC	ON				
	EMBENTHIC	IN		X		
	EPILITHIC	ROCK				
	EPIPHYTIC	PLANT				
	OTHER			X		SAND
HOME	RETREAT BUILDER					
	CASE MAKER			X		ROCK FRAGMENTS
	FREELIVING					
DIET	CARNIVORE					
	HERBIVORE			X		
	OMNIVORE					
	DETRITIVORE			X		
	TURBIDITY				X	0 - 26
	CURRENT					
TEMP.	EUTHERMAL	>30C				2 - 18.5
	MESOTHERMAL	15-30C	X		X	
	OLIGOTHERMAL	<15C	X		X	
	STENOTHERMAL	<5C	X		X	
PH	ACIDOBIONTIC	<5.5				
	ACIDOPHILIC	<7.0	X		X	6.3 - 6.9
	ALKALIPHILOUS	>=7.0				
	ALKALIBIONTIC	>8.5				
DO	DISS. OXYGEN	% SAT.				
		MG/L	X		X	8 - 13.8
H_2O CHEMISTRY	ALKALINITY	PHTH.				
		TOTAL	X		X	2.2 - 10
	NITRATES					
	NITRITES					
	AMMONIA					
	PHOSPHORUS	ORTHO				
		TOTAL			X	4.05 - 9.84
	SEASONAL	L		X		MAY
	DISTRIBUTION	A				
GEOGRAPHIC DISTRIBUTION	REGION I					
	REGION II					
	REGION III					
	REGION IV		X	X	X	
	REGION V					
	REGION VI					
	REGION VII					
	REGION VIII					
	REGION IX					
	REGION X					

STATES AND PROVINCES MENTIONED: NC

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (244, 283) SPEC. COND. 8 - 20; PHTH. ACIDITY as $CaCO_3$ 2.0 - 5.0; TOT.HARDNESS as $CaCO_3$ 7 - 24; SO_4 0 - 5.8; Ca 0.470 - 1.077; Mg 0.213 - 0.648; K 0.431 - 0.616; Na 0.639 - 1.125

Sericostomatidae *Gumaga griseola* (McLachlan)

	SOURCE		235	275	NOTES OR RANGES
	PARAMETERS				
	LARVAE		X	X	
	ADULT				
GENERAL HABITAT	LAKE/POND				
	RIVER		X		
	STREAM			X	
	SPRING			X	
	TEMP. WATERS				
SPECIFIC HABITAT	EPIBENTHIC	ON		X	
	EMBENTHIC	IN			
	EPILITHIC	ROCK		X	
	EPIPHYTIC	PLANT			
	OTHER				
HOME	RETREAT BUILDER				
	CASE MAKER			X	SAND
	FREELIVING				
DIET	CARNIVORE				
	HERBIVORE				
	OMNIVORE				
	DETRITIVORE				
	TURBIDITY		X		0.3 - 23 NTU
	CURRENT			X	RUNNING WATER
TEMP.	EUTHERMAL	>30C			2.6 - 23
	MESOTHERMAL	15-30C	X		
	OLIGOTHERMAL	<15C	X		
	STENOTHERMAL	<5C	X		
PH	ACIDOBIONTIC	<5.5			
	ACIDOPHILIC	<7.0	X		6.0
	ALKALIPHILOUS	>=7.0	X		8.2
	ALKALIBIONTIC	>8.5			
DO	DISS. OXYGEN	% SAT.			
		MG/L			
H_2O CHEMISTRY	ALKALINITY	PHTH.			
		TOTAL			
	NITRATES		X		<0.05 - 0.18
	NITRITES				
	AMMONIA				
	PHOSPHORUS	ORTHO	X		<0.02 - 0.05
		TOTAL	X		0.02 - 0.86
	SEASONAL	L			
	DISTRIBUTION	A			
GEOGRAPHIC DISTRIBUTION	REGION I				
	REGION II				
	REGION III				
	REGION IV				
	REGION V				
	REGION VI				
	REGION VII				
	REGION VIII				
	REGION IX				
	REGION X		X		

STATES AND PROVINCES MENTIONED: OR

ADDITIONAL WATER QUALITY DATA AND COMMENTS: (235) SPEC. COND. 32 - 118; TOT. KJ. N 0.03 - 0.22; Si 9.1 - 47.6; TOT. RESIDUE 55 - 102.3; TOT. ORG. C 0.1 - 5.1; Fe 0 - 0.71; Ca 6.0 - 16; Mg 1.4 - 6.0; Na 3.0 - 8.4; K 0.4 - 1.6; HCO_3 30 - 60; Fl 0 - 0.6; SO_4 3.0 - 12; Cl 1 - 8.5; B 0 - 0.06; Ca-Mg HARDNESS 21 - 53; NON-CARBONATE HARDNESS 0 - 10; ELEVATION 660 - 1500 FT

SECTION VI

SUMMARY AND RECOMMENDATIONS

Forbes (1925) stated over seventy years ago that, "it would be indeed quite impossible, within reasonable limits to go into details respecting the organic relations of the animals of these waters." We look at the task as not impossible, but already initiated. The work on environmental requirements and pollution tolerance of Trichoptera as well as other benthic macroinvertebrates has just begun. In very few cases have quantitative collections of caddisfly species been correlated with a critical assessment of their fresh water habitats. It is up to the users of these series to add additional materials to strengthen our data base. We have assembled water quality information on only two hundred forty-five species of the order. This should provide a starting point for future workers not an end point.

Originally, we set out to write profiles for three hundred trichopteran species. We did not accomplish this for several reasons. First of all there is a definite lack of taxonomic work available on the larvae of this order. What has been done is excellent, but more work needs to be accomplished. Many references with good water quality data are not included because they treat trichopteran species only at the generic level. Often the only literature available on trichopteran species are the larval descriptions or species lists which make no mention of habitat or water quality requirements; data that would be extremely valuable to practicing water pollution biologists. Many ecological surveys, impact statements, faunistic studies, and behavioral works are done without any correlation with water quality information, hence the works are often times good only for distributional data and really do not allow the reader to make conclusions either on environmental requirements and/or tolerance levels. No data are available utilizing Trichoptera as a bioassay tool and seldom are water quality data given for reared caddisflies. Tolerance limits for individual species, indeed, the stages of individual species are finite, but cannot be identified without more information.

Trichoptera species interact with other aquatic macroinvertebrates in the same communities. Water quality limitations on non-trichopteran species may also influence the caddisfly distribution. The caddisfly may not be present because its neighbor in the community upon which it is dependent is not present. It became very apparent that community organization should be looked at when dealing with environmental requirements. This entire series including the chironomids, diatoms, mayflies, and stonefiles should be utilized when dealing with pollution tolerance. Only through utilization of a community profile can one come up with a true index to water quality.

Even the limited amount of data we present is often cumbersome to handle. We utilize ranges, but do not give means or modes for physical and chemical measurements recorded. Finite ranges are a step in the right direction, hopefully better than a subjective word description of water quality. However, future studies would and/or should be better off if they recorded and retrieved data via computer to make maximum use of the data available.

Finally, this study demonstrated to us that perhaps the emphasis in the utilization of benthic macroinvertebrates in pollution studies may be misdirected. Rather than using the benthic organism as an indicator species of water quality, perhaps it would be better to place emphasis on the water quality or habitat as an indicator of the presence or absence of a healthy benthic community. Either way, it is hoped this book will become an active resource for further studies.

SECTION VII

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